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5 Attorneys for Plaintiff SYNOPSYS, INC.
 6 and for Defendants AEROFLEX INCORPORATED,
 AEROFLEX COLORADO SPRINGS, INC., AMI
 7 SEMICONDUCTOR, INC., MATROX
 ELECTRONIC SYSTEMS, LTD.,
 8 MATROX GRAPHICS, INC.,
 MATROX INTERNATIONAL CORP.,
 9 and MATROX TECH, INC.

10 UNITED STATES DISTRICT COURT
 11 NORTHERN DISTRICT OF CALIFORNIA
 12 SAN FRANCISCO DIVISION

13 RICOH COMPANY, LTD.,

14 Plaintiff,

15 vs.

16 AEROFLEX INCORPORATED, et al.,

17 Defendants.

18 SYNOPSYS, INC.

19 Plaintiff,

20 vs.

21 RICOH COMPANY, LTD.,

22 Defendant.

Case No. C03-04669 MJJ (EMC)
 C03-02289 MJJ (EMC)

**DECLARATION OF DENISE M. DE MORY
 IN SUPPORT OF DEFENDANTS' REPLY
 IN SUPPORT OF MOTION FOR LEAVE
 TO AMEND ANSWERS**

Judge: Hon. Martin J. Jenkins

Date: December 13, 2005

Time: 9:30 a.m.

Ctrm: Courtroom 11, 19th Floor

24 I, Denise M. De Mory, hereby declare:

25 1. I am an attorney at law duly authorized to practice before all courts of this state of
 26 California and am a partner at the law firm of Howrey LLP, attorneys for plaintiff Synopsys, Inc.
 27 ("Synopsys") and defendants Aeroflex Incorporated, Aeroflex Colorado Springs, Inc., AMI
 28 Semiconductor, Inc., Matrox Electronic Systems Ltd., Matrox Graphics Inc., Matrox International

1 Corp., and Matrox Tech, Inc. (the “Customer Defendants”). The matters set forth in this declaration
 2 are based upon my personal knowledge, except where otherwise indicated, and if called as a witness, I
 3 could and would testify competently thereto.

4 2. Attached hereto as Exhibit 1 is a true and correct copy of a letter dated September 29,
 5 2005 from Donald E. Walther of ITT Industries to Y. R. Hladkyj of Aeroflex Colorado Springs and
 6 Jaclyn C. Fink of Howrey LLP.

7 3. Attached hereto as Exhibit 2 is a true and correct copy of a letter dated October 21,
 8 2005 from Dwayne L. Abbott of Boeing to Robert W. Whetzel and Steven J. Fineman of Richards,
 9 Layton and Finger, P.A.; Francis DiGiovanni of Connolly, Bove, Lodge & Hutz LLP; Gary Hoffman,
 10 Eric Oliver and Edward Meilman of Dickstein, Shapiro, Morin & Oshinsky LLP; Teresa M. Corbin of
 11 Howrey LLP; and Alan H. MacPherson of MacPherson, Kwok Chen & Heid LLP.

12 4. Attached hereto as Exhibit 3 is a true and correct copy of Common Terms and
 13 Conditions Guide, Section 5 – Government Contract Requirements, Clause Number: 5003, Effective:
 14 01/23/2004 which was located on and printed from Boeing’s website.

15 5. Attached hereto as Exhibit 4 is a true and correct copy of a document entitled “About
 16 Aeroflex UTMC” dated March 19, 2002 produced by Ricoh as RCL005694-RCL005697.

17 6. Attached hereto as Exhibit 5 is a true and correct copy of a Press Release dated April
 18 23, 2001 entitled “Aeroflex UTMC Announces ASIC Design System Version 3.0 Release” produced
 19 by Ricoh as RCL008945-RCL008946.

20 7. Attached hereto as Exhibit 6 is a true and correct copy of document entitled “Aeroflex
 21 UTMC System-on-a-Chip Mixed-Signal ASICs” produced by Ricoh as RCL009345-RCL009356.

22 I declare under penalty of perjury under the laws of the United States of America that the
 23 foregoing is true and correct. This declaration was executed in San Francisco, California on November
 24 29, 2005.

25 _____
 26 /s/Denise M. De Mory
 27 Denise M. De Mory
 28



Donald E. Walther
Associate General Counsel

ITT Defense

1919 West Cook Road
P.O. Box 3700
Fort Wayne, IN 46801
tel: 260 / 451-6799
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September 29, 2005

Y.R. Hladkyj
General Counsel
Aeroflex Colorado Springs, Inc.

Jaclyn Fink
Howrey LLP
525 Market Street
Suite 3600
San Francisco, CA 94105-2708

Re: Potential Disclosure of ITT Industries, Inc. Proprietary Information

Dear Mr. Hladkyj and Ms. Fink:

We are in receipt of Mr. Hladkyj's letters of September 15, 2005, to Mr. Paul Larue regarding the infringement suit initiated by Ricoh Company LTD and currently before the United States District Court, Northern California, San Francisco Division.

Thank you for advising us of the possibility that Aeroflex may feel compelled to disclose the specifications, register transfer list or other information associated with our ASIC design in response to Ricoh's discovery requests.

Assuming that the patent claims are directed to the silicon compiler or its use, we question how the design details for our ASIC design could be relevant to a claim of infringement of validity.

Moreover, we would encourage you to investigate whether the claims pending against Aeroflex are appropriate in light of 28 USCS § 1498 (Authorization and Consent).

Finally, disclosure of such data to Ricoh may be inappropriate absent the protections required by U.S. export laws as the ASIC design data at issue may be ITAR-controlled.

In the event that Aeroflex does intend to produce ITT proprietary information during the course of discovery or at trial, we would request that you notify us well in advance of such production so that we may seek a suitable protective order.

Please address further correspondence—including all notices regarding anticipated production of ITT proprietary information—to my attention at the address appearing above. We appreciate your professional courtesy in this matter.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Donald E. Walther', written over a horizontal line.

Donald E. Walther
Associate General Counsel
ITT Defense
(260) 451-6799
don.walther@itt.com

Copy: Anthony Lomnicki
K. P. Larue

The Boeing Company
P.O. Box 2515
2201 Seal Beach Boulevard
Seal Beach, CA 90740-1515

Dwayne L. Abbott
Counsel
M/C 110-SB37
(562) 797-2596
(562) 797-5782 - Fax
dwayne.l.abbott@boeing.com

Via Facsimile & US Mail

October 21, 2005



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San Jose, CA 95014

Re: Ricoh Company, Ltd. v. Aerflex Incorporated, et al.
Case No.: 03-103-GMS

Dear Counsel:

I am an attorney for The Boeing Company and have been informed by defendant Aeroflex that documents containing Boeing data and information have been requested in discovery.

Boeing does not consent to any of its documents or information being produced in this lawsuit. We have reviewed the material that Aeroflex believes is responsive to the discovery requests served in this lawsuit and have determined that it is ITAR (22 USC 2778 et. seq. 22 CFR 120-130) controlled material and cannot be produced. Plaintiff, Ricoh Company is a foreign person pursuant to the statute, and we believe that other parties in the lawsuit either represent foreign persons, employ foreign persons or are

P:/dlabbott/Ricoh

All Counsel on Ricoh v. Aeroflex
October 21, 2005
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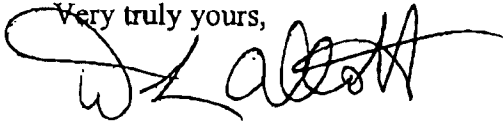
foreign persons pursuant to the statute and implementing regulations. Therefore, you are not authorized to possess the information and documents currently in the possession of Aeroflex.

Not only would transmission of those documents and information from Aeroflex to you be an act punishable by criminal prosecution, your possession of those documents and information would be punishable as well.

If you have any questions, feel free to call me.

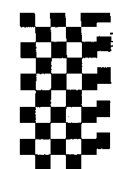

BOEING

Very truly yours,



Dwayne L. Abbott
Counsel

DLA/kle



LITIGATION
LAW GROUP

MAILCODE 110-SB37
2201 SEAL BEACH BOULEVARD
SEAL BEACH, CA 90740-5603

DWAYNE L. ABBOTT
COUNSEL

TELEPHONE 562.797.2596
FAX 562.797.5782
DWAYNE.L.ABBOTT@BOEING.COM

Total pages: 3

Date: October 21, 2005

To: Robert W. Whetzel p. (302) 651-7634 f. (302) 651-7701
Gary M. Hoffman p. (202) 828-2228 f. (202) 887-0689
Edward A. Meilman p. (212) 896-5471 f. (212) 997-9880
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—Teresa M. Corbin p. (650) 463-8100 f. (650) 463-8400
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2005 OCT 21 PM 3:45

Subject: Ricoh Company, Ltd. v. Aeroflex Incorporated, et al.

THIS FACSIMILE IS INTENDED ONLY FOR THE PERSON TO WHOM IT IS ADDRESSED AND MAY CONTAIN PRIVILEGED, PROPRIETARY, OR OTHER DATA PROTECTED FROM DISCLOSURE UNDER APPLICABLE LAW. If you are not the addressee or the person responsible for delivering this to the addressee, you are hereby notified that reading, copying or distributing this transmission is prohibited. If you have received this facsimile in error, please telephone us immediately and return it by mail to the sender at the above address. Thank you for your cooperation.

IF YOU HAVE DIFFICULTIES WITH THIS TRANSMISSION, PLEASE CALL 562.797.5696.

RECEIVED TIME OCT 21 3:40PM

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NAS15-10000
INTERNATIONAL SPACE STATION PROGRAM (ISS)

(a) FAR CLAUSES

The following contract clauses are incorporated by reference from the Federal Acquisition Regulation and apply to the extent indicated. Unless provided for elsewhere in this contract, only subparagraph (44) [FAR 52.244-6 and the clauses listed therein] of this paragraph (a) shall apply to any portion of this contract that is for commercial items or commercial components, as those terms are defined at FAR 52.202-1. In all of the following clauses, "Contractor" and "Offeror" shall mean Seller.

(1) **52.203-3 Gratuities** (APR 1984) [excluding subparagraph (c)(2)]. In paragraph (a), Government means United States of America Government or Buyer. In paragraphs (c) and (d), Government means Buyer.

(2) **52.203-6 Restrictions on Subcontractor Sales to the Government** (JUL 1995). This clause applies only if this contract exceeds \$100,000.

(3) **52.203-7 Anti-Kickback Procedures** (JUL 1995) [excluding subparagraph (c)(1)]. This clause applies only if this contract exceeds \$100,000. Buyer may withhold from sums owed Seller the amount of any kickback paid by Seller or Seller's subcontractors at any tier if (a) the Contracting Officer so directs, or (b) the Contracting Officer has offset the amount of such kickback against money owed Buyer under the prime contract.

(4) **52.203-8 Cancellation, Rescission, and Recovery of Funds for Illegal or Improper Activity** (JAN 1997). This clause applies to this contract if the Seller, the Seller's employees, officers, directors or agents participated personally and substantially in any part of the preparation of a proposal for this contract. The Seller shall indemnify Buyer for any and all losses suffered by the Buyer due to violations of the Act (as set forth in this clause) by Seller or the Seller's subcontractors at any tier.

(5) **52.203-10 Price or Fee Adjustment for Illegal or Improper Activity** (JAN 1997). This clause applies only if this contract exceeds \$100,000. If the Government reduces Buyer's price or fee for violations of the Act by Seller or Seller's subcontractors at any tier, Buyer may withhold or recover from Seller the amount of the reduction.

(6) **52.203-11 Certification and Disclosure Regarding Payments to Influence Certain Federal Transactions** (APR 1991). This clause applies only if this contract exceeds \$100,000.

(7) **52.203-12 Limitation on Payments to Influence Certain Federal Transactions** (JUN 1997). This clause applies only if this contract exceeds \$100,000. Paragraph (c) (4) is modified to read as follows: "(c) (4) Seller will promptly submit any disclosure required (with written notice to Buyer's Authorized Procurement Representative) directly to the PCO for the prime contract. Buyer will identify the cognizant Government PCO at

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Seller's request. Each subcontractor certification will be retained in the subcontract file of the awarding contractor."

(8) **52.211-15 Defense Priority and Allocation Requirements** (SEP 1990).

(9) Reserved.

(10) **52.215-2 Audit -- Negotiation** (JUN 1999). This clause applies only if this contract exceeds \$100,000.

(11) **52.215-10 Price Reduction for Defective Cost or Pricing Data** (OCT 1997). This clause applies only if this contract exceeds \$550,000. In subparagraph (3) of paragraph (a), insert "of this contract" after "price or cost." In Paragraph (c), "Contracting Officer" shall mean "Contracting Officer or Buyer." In Paragraphs (c)(1), (c)(1)(ii), and (c)(2)(i), "Contracting Officer" shall mean "Contracting Officer or Buyer." In Subparagraph (c)(2)(i)(A), delete "to the Contracting Officer." In Subparagraph (c)(2)(ii)(B), "Government" shall mean "Government or Buyer." In Paragraph (d), "United States" shall mean "United States or Buyer."

(12) **52.215-12 Subcontractor Cost or Pricing Data** (OCT 1997). This clause only applies only if this contract exceeds \$550,000. The certificate required by paragraph (b) of the referenced clause shall be modified as follows: delete "to the Contracting Officer or the Contracting Officer's representative" and substitute in lieu thereof "The Boeing Company or any of its wholly owned subsidiaries."

(13) **52.215-14 Integrity of Unit Prices** (OCT 1997) with Alternate I (OCT 1997) [excluding paragraph (b)]. This clause applies only if this contract exceeds \$100,000. This clause is not applicable to service contracts that do not require delivery of supplies.

(14) **52.215-15 Pension Adjustments and Asset Reversions** (DEC 1998). This clause applies only if under this contract certified cost or pricing data is required or preaward or postaward cost determinations are subject to FAR part 31. Buyer may withhold or recover from Seller such sums as the Contracting Officer withholds or recovers from Buyer because of liabilities of Seller or Seller's subcontractors at any tier under this clause. "Contracting Officer" shall mean Buyer.

(15) **52.215-18 Reversion or Adjustment of Plans for Postretirement Benefits (PRB) Other Than Pensions** (OCT 1997). This clause applies only if under this contract certified cost or pricing data is required or preaward or postaward cost determinations are subject to FAR subpart 31.2. Buyer may withhold or recover from Seller such sums as the Contracting Officer withholds or recovers from Buyer because of liabilities of Seller or Seller's subcontractors at any tier under this clause.

(16) **52.215-19 Notification of Ownership Changes** (OCT 1997). This clause applies only if under this contract certified cost or pricing data is required or preaward or postaward cost determinations are subject to FAR subpart 31.2. Buyer may withhold or recover from Seller such sums as the Contracting Officer withholds or recovers from

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Buyer because of liabilities of Seller or Seller's subcontractors at any tier under this clause. "Contracting Officer" means Buyer.

(17) **52.215-21 Requirements for Cost or Pricing Data or Information Other Than Cost or Pricing Data - Modifications** (OCT 1997). This clause applies only if this contract exceeds \$500,000. "Contracting Officer" shall mean Buyer in subparagraph (a).

(18) **52.219-8 Utilization of Small Business Concerns** (OCT 2000). This clause applies only if this contract exceeds \$100,000.

(19) **52.219-9 Small Business Subcontracting Plan** (JAN 2002). This clause applies only if this contract exceeds \$500,000 and Seller is not a small business concern. In paragraph (c), "Contracting Officer" shall mean Buyer.

(20) **52.222-1 Notice to the Government of Labor Disputes** (FEB 1997).

(21) Reserved.

(22) Reserved.

(23) **52.222-21 Prohibition of Segregated Facilities** (FEB 1999).

(24) **52.222-26 Equal Opportunity** (APR 2002) [subparagraphs (b)(1) through (11)]

(25) **52.222-35 Equal Opportunity for Special Disabled Veterans; Veterans of the Vietnam Era; and Other Eligible Veterans** (DEC 2001). This clause applies only if this contract is for \$25,000 or more.

(26) **52.222-36 Affirmative Action for Workers With Disabilities** (JUN 1998). This clause applies only if this contract exceeds \$10,000.

(27) **52.222-37 Employment Reports on Special Disabled Veterans; Veterans of the Vietnam Era; and Other Eligible Veterans** (DEC 2001). This clause applies only if this contract is for \$25,000 or more.

(28) **52.223-3 Hazardous Material Identification and Material Safety Data** (NOV 1991) with Alternate I (NOV 1991) [Prime Contract Clause I.5]. In Alternate I paragraph (i) (1), "Contracting Officer" means "either a US Government Contracting Officer or Buyer's Authorized Procurement Representative."

(29) Reserved.

(30) Reserved.

(31) **52.225-8 Duty-Free Entry** (FEB 2000). This clause applies only if supplies are to be afforded duty-free entry or foreign supplies in excess of \$10,000 may be imported into the customs territory of the United States.

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(32) **52.225-13 Restrictions on Certain Foreign Purchases** (OCT 2003).

(33) **52.227-1 Authorization and Consent** (JUL 1995). Alternate 1 (APR 1984).

(34) **52.227-2 Notice and Assistance Regarding Patent and Copyright Infringement** (AUG 1996). This clause applies only if this contract exceeds \$100,000. A copy of each notice sent to the Government will be sent to Buyer's Authorized Procurement Representative.

(35) **52.227-11 Patent Rights -- Retention by the Contractor (Short Form)** (JUN 1997). This clause applies only if this contract is for experimental, developmental, or research work and Seller is a small business or nonprofit organization.

(36) **52.227-14 Rights in Data -- General (JUN 1987), Alternate II (JUN 1987), Alternate III (JUN 1987), and Alternate V (JUN 1987) as modified by NASA FAR Supplement 18-52.227-14** (OCT 1995). This clause applies only if data will be produced, furnished, or acquired under this contract.

(37) **52.227-16 Additional Data Requirements** (JUN 1987). This clause applies only if technical data or computer software will be generated or delivered under this contract.

(38) Reserved).

(39) Reserved.

(40) **52.230-6 Administration of Cost Accounting Standards** (NOV 1999). This clause applies only if clause 3050, 3051, 3066, 3067, H001, H002, H003, or H004 is incorporated in this contract. Add "Buyer and the" before "Contracting Officer" in paragraph (f).

(41) **52.237-2 Protection of Government Buildings, Equipment, and Vegetation** (APR 1984). This clause applies only if work will be performed on a Government installation. "Contracting Officer" shall mean Buyer.

(42) **52.244-2 Subcontracts** (AUG 1998), paragraphs (h), (i), and (j) only. In these paragraphs, "Government" means "Buyer" and "Contracting Officer" means "Buyer's Authorized Procurement Representative".

(43) **52.244-5 Competition in Subcontracting** (DEC 1996).

(44) **52.244-6 Subcontracts for Commercial Items** (MAY 2002).

(45) **52.245-2 Government Property** (Fixed-Price Contracts) (DEC 1989). FAR 52.245-2 is not applicable if this contract incorporates GP4; however, paragraphs (45.1) through (45.10) apply regardless of whether or not this contract incorporates GP4.

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(45.1) **DEFINITIONS.** In this clause, the terms "Government-furnished property" and "Government Property" shall include both Buyer-furnished Government-owned and Government-furnished Government-owned property, and shall not include Buyer-owned property in which the Government does not have an interest, and all references to title passing to or vesting in the Government shall refer to the United States of America Government. References to an "approved program or system" shall be references to "a United States of America Government approved program or system". "Contracting Officer" shall mean "Buyer's Authorized Procurement Representative" and "Government" shall mean "Buyer" except as stated above.

(45.2) **DATE OF THE PRIME CONTRACT.** The date of prime contract NAS15-10000 is 13 January 1995.

(45.3) **LIMITED RISK OF LOSS REQUESTS.** The Seller shall submit requests for limited risk of loss to the Buyer's Authorized Procurement Representative. Requests for Limited Risk Of Loss must include: (i) a listing, including quantity and unit prices, of all Loss, Damage, or Destruction of Government Property the requesting activity has incurred in three years prior to the date of request, (ii) the total quantity and cost of all Government Property accountable to the Seller's site performing the subcontract at the time of the request, and (iii) a copy of the Seller's most recent Formal Government Property System Analysis or a statement that no such analysis has been conducted at the site involved. In the event the Seller's request is for, or includes, limited risk of loss for a Seller subcontractor, Seller shall submit the information listed above on each Seller subcontractor to whom Seller is requesting that limited risk of loss be extended.

(45.4) **FINANCIAL REPORTING OF NASA PROPERTY IN THE CUSTODY OF CONTRACTORS.** Seller shall provide data on government owned Seller-held property, in accordance with the provisions at FAR 45.5 and this clause, on the indicated basis as illustrated in paragraphs 45.5 and 45.6 of this clause below. Report Government-Owned/Contractor-Held Property, in accordance with the instructions on the Buyer provided form (HOU-BMF-1018) and the direction provided below in paragraphs 45.5 and 45.6. HOU-BMF-1018 should be completed as described in NASA FAR Supplement 1845.7101, Instructions for preparing NASA Form 1018, except as stated in this clause or the instructions on HOU-BMF-1018.

(45.5) **QUARTERLY SUBMISSION.** {Prime contract H.52} In accordance with PIC 03-14, the Seller shall submit quarterly the requested government property financial data for all assets, including real property and equipment, special test equipment, special tooling, and agency peculiar property, greater or equal to \$100,000 unit acquisition cost, as well as materials and contract work in process of any value, in their possession (including subcontractors), in the format requested, with copies of the supporting data utilized to achieve the reported quantities and values. The Seller shall submit the requested data and supporting documentation to the Buyer's Authorized Procurement Representative, according to the following schedule:

For the quarter ending December 31, on or before January 10.

For the quarter ending March 31, on or before April 10.

For the quarter ending June 30, on or before July 10.

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For the quarter ending September 30, on or before October 5.
Unit Prices of submitted data shall be compliant with NASA FAR Supplement 1845.7101-3, and shall be developed using actual costs to the greatest extent possible, especially costs directly related to fabrication such as labor and materials. Where estimates are used, there must be a documented basis. Supporting documentation shall be maintained and available for all amounts reported.

(45.6) **ANNUAL SUBMISSION.** The Seller shall submit annually the requested government property financial data for all assets, including real property and equipment, special test equipment, special tooling, and agency peculiar property, regardless of unit acquisition cost, as well as materials and contract work in process of any value, in their possession (including subcontractors). The submitted government property financial data shall be in the format requested, with copies of the supporting data utilized to achieve the reported quantities and values. The Seller shall submit the requested data and supporting documentation to the Buyer's Authorized Procurement Representative, prior to October 15 of each year. Unit Prices of submitted data shall be compliant with NASA FAR Supplement 1845.7101-3, and shall be developed using actual costs to the greatest extent possible, especially costs directly related to fabrication such as labor and materials. Where estimates are used, there must be a documented basis. Supporting documentation shall be maintained and available for all amounts reported.

(45.7) **GOLD SYSTEM USAGE.** The seller shall perform government property management of all property accountable (including facilities, special test equipment, special tooling, material, and agency peculiar property) under this subcontract using the provided International Space Station GOLD system.

(45.8) **MOVEMENT OF ITEMS.** Movement of items of Government-Owned/Contractor Held Property shall comply with the shipment provisions at NASA FAR Supplement 1845.7101-2(a) through (c) and 1845.7102 Sections I through VIII. Property shipped between September 1 and September 30, inclusively, shall be accounted for and reported by the shipping activity, regardless of the method of shipment, unless written evidence of receipt at destination has been received.

(45.9) **REPAIRABLES.** Repairables provided under fixed price repair contracts that include the clause at 1852.245-72, Liability for Government Property Furnished for Repair or Other Services, remain accountable to the furnishing activity and are not reportable on HOU-BMF-1018; repairables provided under a cost reimbursement contract, however, are accountable to the contractor and reportable on the HOU-BMF-1018. All materials provided to conduct repairs are reportable, regardless of contract type.

(45.10) **NON-INTERFERENCE, RENT-FREE USAGE AGREEMENTS.** Government-Owned or Boeing-Owned Seller-Held Property shall be used only for the purpose for which it was acquired, fabricated, or provided. The Seller shall submit all requests for non-interference, rent-free usage to the Buyer's Authorized Procurement Representative. See NASA FAR Supplement 18-52.245-80 Use Of Government

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Production And Research Property On A No-Charge Basis (NASA) (MAR 1989), for a listing of non-interference , rent-free usage agreements already in effect.

(45.11) **SPECIAL PROVISION FOR GOVERNMENT FURNISHED DATA** {Prime contract H.16} Government Furnished Data shall in every respect be subject to the Government property clause of this contract.

(46) **52.245-18 Special Test Equipment** (FEB 1993). Wherever "30 days" appears in this clause, substitute "75 days." The following provision is added to the end of paragraph (b) of the clause: "Notification required by this clause shall contain the following information for each item of special test equipment or components thereof: A list of alternate items that could be used; Estimated cost; Function; Technical justification for this item; and Date item is required. If required date is within seventy-five (75) days of the date of the notification, give reason for the late notice." Notwithstanding paragraph (c) of the referenced clause, Seller shall not buy or make any item of special test equipment without Buyer's prior written consent.

(47) **52.246-24 Limitation of Liability - High Value Items** (APR 1984). This clause applies only if this contract exceeds \$100,000 and requires the delivery of supplies.

(48) **52.246-25 Limitation of Liability -- Services** (FEB 1997). This clause applies only if this contract exceeds \$100,000 and requires delivery of services.

(49) **52.247-63 Preference for U.S. - Flag Air Carriers** (JAN 1997). This clause applies only if this contract may involve international air transportation.

(50) **52.247-64 Preference for Privately Owned U.S.-Flag Commercial Vessels** (JUN 2000) (**ALTERNATE I**) (APR 1984). In paragraph (C)(2) "20" and "30" are changed to 10 and 20 respectively.

(51) **52.247-67 Submission of Commercial Transportation Bills to the General Services Administration for Audit** (JUN 1997). In this clause "Contractor" means "Buyer" and "first-tier subcontractor" means "Seller". Seller shall furnish Buyer all documents necessary to allow Buyer to comply with this clause.

(52) **52.248-1 Value Engineering** (FEB 2000) [excluding subparagraph (f)]. This clause applies only if this contract is for \$100,000 or more. If a Value Engineering Change Proposal is accepted by the Government, Seller's share will be 50% of the instant, concurrent and future contract net acquisition savings and collateral savings that Buyer receives from the Government. Seller's negotiated share of net acquisition savings or collateral savings shall not reduce the Government's share of concurrent or future savings or collateral savings. Buyer's payments to Seller under this clause are conditioned upon Buyer's receipt of authorization for such payments from the Government.

(b) **NASA FAR SUPPLEMENT CLAUSES**

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The following contract clauses are incorporated by reference from the National Aeronautics and Space Administration Federal Acquisition Regulation Supplement with full force and effect, as if set forth in full text and apply to the extent indicated. In all of the following clauses, "Contractor" and "Offeror" shall mean Seller.

- (1) **18-52.204-76 Security Requirements for Unclassified Information Technology Resources** (JUL 2002). This clause is applicable to all or any part of the contract that includes information technology resources or services in which the Seller must have physical or electronic access to NASA's sensitive information contained in unclassified systems that directly support the mission of the Agency.
- (2) **18-52.208-81, Restrictions on Printing and Duplicating** (OCT 2001).
- (3) **18-52.211-70, Packaging, Handling, and Transportation** (JUN 2000). {Prime Contract D.1.}
- (4) **18-52.219-74 Use of Rural Area Small Businesses** (SEP 1990). This clause applies only if this contract offers subcontracting possibilities.
- (5) **18-52.219-75 Small Business Subcontracting Reporting** (MAY 1999). This clause applies only if this contract exceeds \$500,000 and Seller is not a Small Business concern.
- (6) **18-52.219-76 NASA 8 Percent Goal** (JUL 1997). This clause applies only if this contract exceeds \$500,000 and Seller is not a Small Business Concern. [The following paragraphs implement Prime Contract Clause G. 12 SOCIOECONOMIC SUBCONTRACTING GOALS.]
- (6.1) NASA's objective is to ensure the execution of a vigorous program at the prime contract and subcontractor levels which will optimize the opportunity for subcontract participation of small business, Small Disadvantaged Business (SDB), Women-Owned Small Business (WOSB), HUBZones, Veteran-Owned Small Businesses (VOSBs), Service-Disabled Veteran-Owned Small Businesses (SDVOSBs), and Historically Black Colleges and Universities/Minority Institutions (HBCU/MIs). To this end the Seller shall comply with the approved subcontract plan set forth in the contract and with any approved Master Subcontracting Plan or DoD Comprehensive Subcontracting Plan that the Seller may have. Changes to the plan will be authorized only by contract modification. In contracts containing award fee, performance by the Seller in exerting its best effort to operate in accordance with this plan shall be a factor in determining award fee under this contract.
- (6.2) The Seller will be evaluated on the Seller's efforts toward achieving the percentages outlined in paragraph (c) below including trends and Seller efforts to meet the goals. The percentages shall be calculated based on the dollars expended to the concerns as compared to Contract total actual expenditures on a quarterly and annual basis.

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(6.3) Subcontracting goals are expected to equal or exceed the following percentages (including lower tier subcontracts) as measured by (b) (5.2) above:

22% Small businesses

11% Small disadvantaged businesses (inclusive of disadvantaged women-owned businesses)

5% Women-owned small businesses (nondisadvantaged women-owned businesses only)

1% HUBZones

1% Veteran-Owned Small Businesses (VOSBs)

1% Service-Disabled Veteran-Owned Small Businesses (SDVOSBs)

1% Historically Black Colleges and Universities/Minority Institutions (HBCU/MIs)

The small business goal of 22% is inclusive of all of the other socio-economic goals identified in this paragraph of this clause .

(7) **18-52.223-70 Safety and Health** (APR 2002). {Prime contract H.1 II} This clause applies only if this contract exceeds \$1,000,000; requires construction, repairs, or alteration in excess of \$25,000; or involves the use of hazardous materials or operations.

(8) **18-52.223-71 Frequency Authorization** (DEC 1988). {Prime contract G.1 II} This clause applies only if this contract requires the development, production, testing, or operation of a device for which a radio frequency authorization is required.

(9) **18-52.223-75 Major Breach of Safety or Security** (FEB 2002). {Prime contract H.1 II}. "Contractor" means "Seller". In paragraphs "a" and "b", "the Government" means "Buyer", except for the term "Government installations". In paragraph "b", "Government installations" means "Government or Buyer installations". In the first sentence in paragraph "c", "the Contracting Officer" shall mean "both the Buyer's Authorized Procurement Representative and the US Government Contracting Officer".

(10) **18.52.225-70 Export Licenses** (FEB 2000) with Alternate I (FEB 2000). {Prime contract H.1 II}

(11) **18-52.225-73 Duty-Free Entry Supplies** (DEC 1988). {Prime contract I.6} In accordance with the Duty-Free Entry clause of this contract, the following supplies will be given duty-free entry:

Product Group	Item Description	Part Number(s)
Boeing-Huntsville	PC Board	3000212-002, 3000214-003, 3000038-002, 3000128-002, 3000125-002, 3000140-002, 3000087-001
Boeing-Huntsville	Casting	3000096-301
Boeing-Huntsville	Die	3000096-101
Boeing-Huntsville	Tooling	3000096-101
Boeing-Huntsville	F/O Splitters	2000011-101, 2000015-101, 2000015-103, 2000015-104
Boeing-Huntsville	QCI Samples	2000011-101, 2000023-101,

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		2000049-101, 2000015-103
Boeing-Huntsville	F/O Combiners	2000023-101, 2000049-101
McDonnell Douglas	FHRC Hoses	5843393-501

(12) **18-52.227-14 Rights in Data - General** (OCT 1995). This clause applies only if data will be produced, furnished, or acquired under this contract, except contracts for basic or applied research with universities or colleges.

(13) **18-52.227-70 New Technology** (MAY 2002). {Prime contract G.1 II} This clause applies only if this contract is for experimental, developmental, or research work and Seller is not a small business or nonprofit organization.

(14) **18-52.227-72, Designation of New Technology Representative and Patent Representative** (JUL 1997) [Prime Contract Clause G.3]. The following named representatives were designated by the Contracting Officer to administer the New Technology or Patent Rights clause:

NASA New Technology Representative and Patent Representative
 NASA Lyndon B. Johnson Space Center
 Attention: New Technology Rep and Patent Rep HA
 Technology Transfer & Commercialization Office
 Houston TX 77058

(15) **18-52.227-86 Commercial Computer Software Licensing** (DEC 1987). This clause applies only if technical data or computer software will be generated or delivered.

(16) **18-52.228-76 Cross Waiver of Liability for Space Station Activities** (DEC 1994). {Prime contract H.1 II}.

(17) **18-52.237-70 Emergency Evacuation Procedures** (DEC 1988). Applies when subcontractor personnel are on United States of America Government facilities.

(18) **18-52.242-72 Observance of Legal Holidays** (AUG 1992). {Prime contract H.1 II} This clause applies only if this contract requires work on a Government installation.

(19) **18-52.242-73 NASA Contractor Financial Management Reporting** (JUL 2000). {Prime contract G.1 II} This clause applies only if this contract is a cost-type, price redetermination or FPI contract. "Contracting Officer" shall mean Buyer's Authorized Procurement Representative.

(20) **18-52.242-75 Earned Value Management System** (MAR 1999). This clause is applicable to contracts valued at \$1M or more that, based on risk or schedule criticality have the potential to impact the successful fulfillment of the prime contract requirements. Insert in Paragraph (f): Subcontracts valued at \$1M or more that, based on risk or schedule criticality have the potential to impact the successful fulfillment of the contract requirements.

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(21) **18-52.244-70 Geographic Participation in the Aerospace Program** (APR 1985). {Prime Contract H.1 II} This clause applies only if this contract is for \$100,000 or more.

(22) **18-52.245-70 Contractor Requests for Government-Owned Equipment** (JUL 1997) [excluding paragraph (b)(3)]. {Prime contract G.1 II} "Contracting Officer" shall mean Buyer. If the equipment is to be acquired as Special Test Equipment (STE), Seller shall submit the applicable request 75 days in advance of the date Seller intends to acquire the equipment. No later than 30 September of each year, Seller will provide Buyer a list of all property acquired under this clause. The list will include at a minimum: (1) part number; (2) serial number; (3) modification number, if any; (4) nomenclature; (5) acquisition cost; (6) acquisition date; and (7) the date of the prior year's list.

(23) **18-52.245-80 Use Of Government Production And Research Property On A No-Charge Basis** (NASA) (MAR 1989). {Prime contract G.7} The contracts specified below are: Contract NAS15-10000 (International Space Station Prime Contract), NAS8-50000, NAS8-50001, NAS 9-02099.

(24) **18-52.246-73, Human Space Flight Item** (MAR 1997).

(c) Cost Accounting Standards

(1) The version of FAR 52.230-2, Cost Accounting Standards, incorporated by clause 3050 is the version dated August 1992.

(2) The version of FAR 52.230-3, Disclosure and Consistency of Cost Accounting Practices, incorporated by clause 3051 is the version dated August 1992.

(3) The version of FAR 52.230-4, Consistency in Cost Accounting Practices, incorporated by clause 3065 is the version dated August 1992.

(4) The version of FAR 52.230-3, Disclosure and Consistency of Cost Accounting Practices, incorporated by clause 3067 is the version dated April 1998.

(d) **HUMAN SPACE FLIGHT ITEM** (NASA FAR Supplement 18-52.246-73) (MAR 1997) statement. "FOR USE IN HUMAN SPACE FLIGHT; MATERIALS, MANUFACTURING, AND WORKMANSHIP OF HIGHEST QUALITY STANDARDS ARE ESSENTIAL TO ASTRONAUT SAFETY. IF YOU ARE ABLE TO SUPPLY THE DESIRED ITEM WITH A HIGHER QUALITY THAN THAT OF THE ITEMS SPECIFIED OR PROPOSED, YOU ARE REQUESTED TO BRING THIS FACT TO THE IMMEDIATE ATTENTION OF THE PURCHASER."

(e) (Limited) Release of Contractor Confidential Business Information (CBI).
[Planned NASA FAR Supplement 18-52.227-91 (MAY 2002)] [Prime Contract H.42]

(1) NASA may find it necessary to release information submitted by the Seller pursuant to the provisions of this contract, to individuals not employed by NASA. Business

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information that would ordinarily be entitled to confidential treatment may be included in the information released to these individuals. Accordingly, by signature on this subcontract, the Seller hereby consents to a limited release of its confidential business information (CBI).

(2) Possible circumstances where the Agency may release the contractor's CBI include the following:

(A) To other Agency contractors and subcontractors, and their employees tasked with assisting the Agency in handling and processing information and documents in the administration of Agency contracts, such as providing post-award audit support and specialized technical support to NASA.

(B) To NASA contractors and subcontractors, and their employees engaged in information systems analysis, development, operation, and maintenance, including performing data processing and management functions for the Agency.

(3) NASA recognizes its obligation to protect the contractor from competitive harm that could result from the release of such information to a competitor. Except where otherwise provided by law, NASA will permit the limited release of CBI under subparagraphs (e) (2) (a) or (e) (2) (b) only pursuant to non-disclosure agreements signed by the assisting contractor or subcontractor, and their individual employees who may require access to the CBI to perform the assisting contract.

(4) NASA's responsibilities under the Freedom of Information Act are not affected by this clause.

(5) The Seller agrees to include this clause, including this paragraph (e) (5), in all subcontracts at all levels awarded pursuant to this contract that require the furnishing of CBI by the subcontractor.

(f) **ACCESS TO CONTRACTOR DATA** [Prime Contract H.43]. This clause applies to all cost type subcontracts valued at \$1,000,000 or more, however, the flowdown requirement applies to all subcontracts.

(1) "Data" for purposes of this clause, means recorded information, regardless of the form or media on which it may be recorded by the Seller or its subcontractors. The term includes technical data; computer software; and information incidental to contract performance. Types of data contained in the definition also include the results of Seller internal audits of any discipline, procedures, system, or task which directly or indirectly supports the performance of this contract as well as data from any audit of subcontractor(s) performing this contract. The term is limited to data that is archived as a normal part of Seller performance.

(2) The Contracting Officer or designee shall, through closeout, have access to and the right to examine any of the data produced or specifically used in the performance of this contract. The purpose of this access provision is to permit sampling of Seller data to

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verify requirements compliance and continuous improvement without unduly increasing the number of data deliverables to this contract.

(3) The Seller shall make available at all reasonable times for Government inspection the most current data produced or used in the performance of this subcontract for examination.

(4) Notwithstanding the Additional Data Requirements clause, the Government shall have the right to reproduce any data found during the examination that it wishes to retain. The Government or the Buyer will reimburse reproduction costs only when the Government uses Seller equipment for the reproduction. The Government shall retain no greater rights in the reproduced data than it would have under the Rights in Data--General clause.

(5) The Seller shall flow this clause to all cost type subcontracts valued at \$1,000,000 or more.

(g) **GOVERNMENT INSIGHT** [Prime Contacts H.44]. This clause applies to cost type subcontracts with valued at \$1,000,000 or more.

(1) Definitions. For the purpose of this contract, the following definitions apply:

"Insight," as used in this clause, means technical visibility into the Program, maintained through audit, surveillance, assessment of trends and metrics, software independent verification and validation, the flight readiness review process, and review or independent assessment of out-of-family anomalies occurring in any phase of the program.

"Surveillance," as used in this clause means continual monitoring and verification of the status of manufacturing, testing, and processing of Station hardware, software and operations preparations to ensure that requirements are being fulfilled. Items to be monitored and verified are selected—this is not an all inclusive activity.

"Audit," as used in this clause, means the implementation of procedures and requirements of the NASA Engineering Quality Audit (NEQA) or other equivalent audit techniques used to perform periodic audit of all aspects of processes and procedures required to manufacture, assemble, test, and process hardware for flight. Audits may include an examination of all disciplines and tasks which are involved with or support Shuttle launch and landing operations, hardware and software production and maintenance, safety and quality assurance, logistics, procurements and operations. These descriptions are illustrative only and shall not be construed as any limitation on the Government's right to conduct an audit of the Buyer, the Seller, and the Seller's subcontractors to determine performance on this contract.

(2) The Government shall have the right to audit the Seller and the Seller's cost reimbursement subcontractors (with values exceeding \$1,000,000) to determine compliance with the requirements of this contract. One purpose of these audits is to

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afford the Government insight into and understanding of Seller and selected Seller subcontractor processes and procedures to determine whether the processes or procedures (1) adversely affect safety; (2) are not within contract performance standards; or (3) adversely affect future launch schedules.

(3) The Government or the Buyer may schedule fact-finding meetings with the Seller and the Seller's subcontractors as necessary to discuss issues requiring Government insight. Scheduling and format of these meetings shall indicate whether exchange of information will be required, and the number and expertise of Buyer, Seller, and subcontractor personnel who shall attend the meetings. When requested by the Contracting Officer or designee, or by the Buyer, the Seller and the Seller's subcontractors shall provide necessary support to the Government when it audits the Seller or the Seller's subcontractor and for the Government-Buyer-Seller-Seller's subcontractor meetings. The purpose of these meetings is to understand the findings of the Government audits. The parties understand and agree that no direction from the Government or constructive change to the contract shall result from any of these meetings.

(h) RESERVED

(i) **Additional Export Control Requirements** {Based on Prime Contract H.47} This clause applies to Sellers and Licensors who are United States of America corporations, companies, partnerships, contractors, firms or businesses.

(1) **US Export Control Laws and Regulations.** The Seller shall comply with all U.S. export control laws and regulations, including the International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120 through 130, and the Export Administration Regulations (EAR), 15 CFR Parts 730 through 799, and NASA FAR Supplement 18-52.225-70 Export Licenses, in the performance of this contract. In the absence of available license exemptions/exceptions, the Seller shall be responsible for obtaining the appropriate licenses or other approvals, if required, for exports of hardware, technical data, and software, or for the provision of technical assistance.

(2) **US Export Licenses/Authorizations.** The Seller shall be responsible for obtaining U.S. export licenses/authorizations, if required, before utilizing foreign persons in the performance of this contract, including instances where the work is to be performed on-site at all NASA and Boeing installations, where the foreign person will have access to export-controlled technical data or software. The Seller, in coordination with Boeing Export Compliance, shall comply with the export process, as defined in this clause, whenever they export NASA owned contract deliverable property to International Partner locations under a NASA license or exception.

(3) **Forwarding Technical Data.** Forwarding technical data related to this contract, written or oral, on paper or electronic, to any other supplier located or incorporated in the United States of America, will include the following warning about U.S. export control laws. The warning will be printed electronically, stamped, or otherwise affixed in writing on the front page of the technical data. If there is any doubt about whether the data is technical or not, consider it to be technical and include the warning:

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“WARNING - Information subject to export control laws. This document, which includes any attachments and exhibits hereto, may contain information subject to International Traffic in Arms Regulations (ITAR) or Export Administration Regulations (EAR), which may not be exported, released, or disclosed to foreign nationals inside or outside the United States, without first obtaining an export license. Violators of ITAR or EAR may be subject to a penalty of ten years imprisonment and a fine of \$1,000,000, under Title 22, United States Code (U.S.C.), Section 2778, Control of Arms Exports and Imports, and Title 50 U.S.C., Appendix 2410, Violations. Include this notice with any reproduced portion of this document.”

(4) Export Control Functions and Procedures. The Seller and the Seller's subcontractors/suppliers shall provide export control functions for all hardware, software and data requiring export in the execution of contract responsibilities. If applicable, the Seller and the Seller's affected subcontractors/suppliers shall establish export control procedures that are compliant with applicable Department of Commerce and Department of State regulations.

(5) Reporting of Potential Issues. The Seller and the Seller's subcontractors/suppliers shall report to the NASA JSC Export Services Team (EST), in writing, and the Boeing Export Compliance office by copy, any potential export issues (including those related to support of sustaining engineering and operations of ISS) that cannot be resolved by the Seller. Such report and/or notification of issues and technical tasks should be reported to the NASA JSC EST at least three months in advance of requested action. The copy to Buyer shall be identified as NAS15-10000 {the number of this contract}. The document shall be in Microsoft Word or Microsoft Excel. The document shall be submitted and maintained electronically. The Seller and the Seller's subcontractors/suppliers shall maintain copies of the documents in accordance with U.S. Export Regulations.

(6) Reporting of Unforeseen Issues. Upon discovery of unforeseen adverse export issues, the Seller shall immediately notify NASA JSC EST by telephone or email of said issue and shall report to the NASA JSC EST, in writing, as the facts become known. The Boeing Export Compliance office shall be provided a copy of all e-mail and written follow-up correspondence and a summary of all telephone conversations. The copy to Buyer shall be identified as NAS15-10000 {the number of this contract}. The document shall be in Microsoft Word or Microsoft Excel. The document shall be submitted and maintained electronically. The Seller and the Seller's subcontractors/suppliers shall maintain copies of the documents in accordance with U.S. Export Regulations

(7) Flowdown. The Seller shall be responsible for ensuring that the provisions of this clause apply to the Seller's subcontractors/suppliers located or incorporated in the United States of America.

(8) Export Records. The Seller or the Seller's subcontractors/suppliers shall keep those records required by Department of Commerce and Department of State

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regulations for all exports and make them available upon request to Buyer, NASA, NASA's representatives, and auditors.

(9) **Self Audits.** If exporting, the Seller and the Seller's subcontractors/suppliers shall perform self annual audits of their export control processes and provide written audit results to Boeing Data Management marked NAS15-10000 {the number of this contract} SDRL SS-EC-002. Audits should include a thorough examination of all export control processes associated with this contract, areas for improvement (if any), and corrective action plans for identified areas of improvement. Affected Sellers are required to do their own self-audits and report the results of the audit to Boeing Data Management marked NAS15-10000 {the number of this contract} SDRL SS-EC-002. Prior to audit completion, inclusion of informal statuses to the Boeing Export Control Office is optional and might prove useful in the success of this effort. The content should be as follows: (1) Define your current audit processes. (2) Document the export control processes audited and audit findings. (3) Based on audit findings, include corrective action plans for any processes identified for improvements and notification of when the correction of any non-conformances has been completed. The document shall be in Microsoft Word or Microsoft Excel. The document shall be submitted and maintained electronically. The submission date shall be July 31 of each year.

(10) **Use of NASA Export License Exceptions of Exemptions.** The remainder of this clause applies if the Seller or any of the Seller's subcontractors/suppliers at any tier use Department of Commerce or Department of State export licenses obtained by NASA or use any NASA export license exceptions or exemptions as they apply to the International Space Station Program. These requirements, do not apply to Seller or Seller's subcontractors/suppliers commercial contract related exports or exports pursuant to Technical Assistance Agreements or other license authorizations received by the Seller or Seller's subcontractors/suppliers and for which the Seller or Seller's subcontractors/suppliers will be the exporter of record (USPPI).

(A) **Approval.** A minimum of 15 working days prior to export, the Seller and any Seller subcontractor/supplier exporting on behalf of NASA must obtain approval from NASA JSC through Boeing Export Compliance by following the Advance Notification of Shipment (ANS) process described below.

(B) **Classification and Need For License.** Before effecting an export on behalf of NASA, the Seller and any Seller subcontractor/supplier shall determine the classification recommendation of the item(s) or document(s) and whether it needs an export license. If required, the Seller shall provide additional technical rationale supporting the classification, as requested by Buyer. If an export license is not in place the Seller will be required to work with Buyer to have NASA obtain the license.

(C) **Notification Contents.** Formal letter, fax or email is sufficient, addressed to the Boeing Export Compliance Office, and must include the details listed below.

(i) NASA license number (include date of expiration) or license exception/exemption.

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- (ii) Quantity and description as it appears on the applicable license.
- (iii) Date of planned shipment (and expected date of return if not a permanent export).
- (iv) Origin of shipment (Company and city).
- (v) Destination of shipment (Country, city and company).
- (vi) Point of contact (for technical questions – must be a representative of the originating shipper).
- (vii) Export Classification Control Number (ECCN) or category under Export Administration Regulations or United States Munitions List regulations.
- (viii) Rationale for classification.
- (ix) Requirement to export (i.e., MOU, contract number, meeting minutes). The Seller may be asked to provide copy of the requirement.
- (x) Additional information as necessary to clarify the export.

This information shall be submitted electronically in Microsoft Word or Excel to Boeing Data Management marked NAS15-10000 {the number of this contract} SDRL SS-EC-001. The Seller shall maintain copies of the documents in accordance with U.S. Export Regulations electronically in Microsoft Word or Excel.

(D) Use of JSC Form 1735. A copy of the completed Pro Forma Invoice (JSC Form 1735) attached to an email is sufficient to meet this requirement as long as all required information above is also included.

(E) Response. After all the information is submitted, Boeing will submit to NASA. NASA in turn will respond to Boeing within ten working days. Boeing will in turn respond to the Seller within two working days of receipt of the NASA response. Once approved, Buyer will provide the destination control statement to Seller to use on all export documentation.

(F) Authorization to Export. Included in the applicable export exceptions, the Seller or the Seller's subcontractors/suppliers are authorized to export hardware, software or data to ISS International Partner (IP) governmental offices that meet the conditions of license exception GOV (15 CFR 740.11(b)(2)(iii)(A)). When directed in writing by the Contracting Officer or designated representative, the Seller or the Seller's subcontractors/suppliers shall export on behalf of NASA, NASA specifically identified technical data, computer software, hardware, or defense services to a named foreign entity or person, in the manner and under the conditions provided for in the direction.

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(G) **Temporary Exports.** For temporary exports, Seller or the Seller's subcontractors/suppliers shipping on behalf of NASA must notify Boeing in writing within three business days of the date that the item was actually returned.

(H) **Copy of All Shipping Documentation.** For Verification of End Use, Seller or the Seller's subcontractors/suppliers shipping on behalf of NASA and using a NASA license or license exception or exemption, shall provide a copy of all shipping documentation within five business days of the shipment date to the Boeing Export Compliance office.

(j) **RESERVED.**

(k) **PACKAGING, HANDLING, STORAGE AND TRANSPORTATION OF FLIGHT HARDWARE.** This clause only applies to Flight Hardware. This clause does not apply commercial items or commercial components, as those terms are defined at FAR 52.202-1, unless they have undergone modifications, screenings or tests that are unique to items sold to NASA.

(1) Seller shall identify all special handling requirements associated with hardware, firmware, materials, devices, items, goods, and articles classified as Flight Hardware (or any similar designation of use in space or use on orbit, such as "ITEMS FOR SPACE FLIGHT USE") (hereinafter referred to as "Flight Items" or "Flight Hardware") purchased or leased on this contract. This identification shall be made on both the shipping document (or as an attachment to the shipping document) and on correlating packaging labels, placards, or large legible printed markings on the exterior of the packaging itself, designed to alert those handling, transporting, shipping, receiving, moving, stacking, unstacking, storing or processing (hereinafter referred to as "Handling") the Flight Items after the Flight Items leave the Seller's facility. If the Seller does not have labels that meet the intent of this clause, the Buyer will supply the required labels. Special Handling requirements include, but are not limited to, the following considerations:

(A) Special Handling instructions (where necessary to prevent damage or deterioration) such as instructions to fork lift operators on how to lift the Flight Item without damaging the Flight Item, "Do not drop", or "this end up" arrows.

(B) Electrostatic discharge (ESD) sensitive item warnings, for example, "Flight hardware; Electrostatic Discharge Sensitive (ESDS), handle IAW MILSTD-1686" or "EEE Part(s); ESDS Device; EMI shielding required".

(C) Temperature range limitations (where the item could be damaged if exposed to temperatures between minus 25 degrees Fahrenheit (F) and 125 degrees F during transportation or between 68 degrees F and 82 degrees F during storage).

(D) Humidity range limitations (where the item could be damaged if exposed to humidity between 30% and 70% relative humidity (RH)).

(E) Fragile item warnings (where the item is fragile or requires shock recorders or indicators during Handling).

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(F) Minimum or maximum bend radius or radii limitations (where a flexible Flight Item could be damaged if excessively bent or folded while being Handled).

(G) Cleanliness requirements or warning not to open except in a Clean Room environment (where the Flight Item is precision cleaned or for any reason should only be opened in a Clean Room environment).

(2) Flight Items that will be stowed for flight with no further processing shall be delivered ready for flight stowage by the Seller and annotated on the shipping document, i.e., "ready for flight; no further processing required". The fact that the item has been packaged with certified flight material(s) shall be marked in some manner on the inner packaging. If it is not feasible to mark the innermost packaging as flight certified material, then a note on the packaging material that is to be removed just prior to stowage shall state "Remove [insert items to be removed] before flight/stowage" OR "Remove [insert items to be removed] before flight/stowage except for [insert exceptions]".

(3) In the event Buyer provides specific labels, those labels shall be applied in accordance with the accompanying instructions to the packaging containing the Flight Items for which the labels were provided.

(4) If no special Handling requirements apply to the Flight Item, the Flight Item shipping documentation shall state "No Special Handling Requirements" or words to that effect.

(5) The Seller's packaging specifications or procedures may be utilized if they are (a) not in conflict with cited Government specifications and (b) approved in writing by the Contracting Officer. In the event of any conflict between Government, Buyer, and Seller specifications or procedures, the Government documents shall take precedence over all else, and Buyer documents shall take precedence over Seller specifications or procedures.

(I) RESERVED.

(m) RESERVED

(n) **CHANGE IN PRIME CONTRACTOR** [Written to implement prime contract Schedule I clause H.72] In the event the Buyer is not selected for the International Space Station follow-on contract, upon the termination or expiration of International Space Station prime contract NAS15-10000, the remaining effort under this contract may, at NASA's option, be transferred via a novation agreement or other mutually agreeable method to the successor contractor selected by NASA or to NASA. The Seller hereby agrees to execute a reasonable mutually agreeable novation agreement between itself, the Buyer, and the successor contractor or the United States of America Government. The Seller hereby agrees to negotiate promptly and in good faith until agreement on the novation agreement or other mutually agreeable method of change of buyer is reached.

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(o) **JSC HAZARDOUS MATERIALS USE** (JSC 52.223-92) (DEC 1999). {Prime contract H.39} This clause applies on to contracts under which hazardous materials will be utilized, or may reasonably be expected to be utilized, onsite at Johnson Space Center (JSC).

(1) This clause is JSC-unique, and the requirements are in addition to any U.S. Environmental Protection Agency, U.S. Occupational Safety and Health Administration, or other state or Federal regulation or statute. Therefore, the following requirements do NOT supercede any statutory or regulatory requirements for any entity subject to this clause.

(2) "Hazardous materials," for the purposes of this clause, consist of the following:

(A) Those materials defined as "highly hazardous chemicals" in Occupational Safety and Health Administration Process Safety Management Regulation, 29 Code of Federal Regulation 1010.119, without regard for quantity.

(B) Those "hazardous substances" subject to the release notification requirements under Environmental Protection Agency's Emergency Planning and Community Right-to-Know Regulation, 40 Code of Federal Regulation 302.4, without regard for quantity.

(C) Any radioisotope material or device that produces ionizing radiation.

(D) Any Class II, III, or IV laser as defined by the American National Standards Institute No. Z136.1 (1986)

(E) Any explosive or any pyrotechnics.

(F) Any pesticide.

(3) The Seller shall develop and maintain an inventory listing the identity and quantity of hazardous materials stored or used onsite at JSC for the performance of the contract.

(4) The Seller shall ensure that the proper training of its employees in the use and inherent hazards of these materials is accomplished prior to use.

(5) The Seller shall notify the JSC Occupational Health and Test Support Office (SD13) prior to any initial use or different application of these materials.

(6) The Seller shall use all hazardous materials properly and take all necessary precautions to ensure no harm is done to humans or the environment.

(7) The Seller shall insert the substance of this clause, including this Paragraph (n) (7) with appropriate changes of designations of the parties, in subcontracts under which hazardous materials will be utilized, or may reasonably be expected to be utilized, onsite at JSC.

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(8) In the event the Seller fails or refuses to comply with any aspect of this clause, such failure or refusal may be considered a material breach of this contract.

(p) SUPPORT FOR GOVERNMENT INSPECTION AND ACCEPTANCE (DD FORM 250) AT SOURCE

(1) In the event of inspection (CQA) and/or acceptance requirements to be performed by the US Government at the Seller or a subcontractor of the Seller (e.g. direct shipment to NASA or delivery-in-place), Buyer shall prepare the DoD FAR Supplement 253.303-250 DD Form 250, Material Inspection and Receiving Report (DD Form 250) and furnish the prepared DD Form 250 to the Seller for presentation to the Buyer Source Inspection Representative or US Government Representative as directed by the Buyer.

(2) Seller shall support Buyer's DD Form 250 preparation effort by promptly providing, upon request, the following information:

(A) Estimated date the shipment will be made available for buyer/government inspection,

(B) Cage Code and complete street address of the "shipped from" location,

(C) The Federal Stock Number (FSN), or non-catalog number and, if applicable, prefix or suffix, for each item. Other needed identification such as the manufacturer's name or Federal Supply Code (as published in Cataloging Handbook H4-1), and part number. The descriptive noun of the item nomenclature and, if provided, the Government-assigned management/material control code. In the case of equal-kind supply items, the description without regard to kind (e.g., "Resistor"). Size, quantity, and type information. Make, model, serial number, lot, batch, hazard indicator, and/or similar description,

(D) Estimated gross shipping weight in pounds, quantity of packages, and, if more than one package will be used, the package number and contents of each package,

(E) Any special handling instructions/limits for material environmental control (e.g., temperature, humidity, aging, freezing, and shock),

(F) Whether Government-furnished property (GFP) is included with or incorporated into each item,

(G) For items shipped with missing components, the FSN or comparable identification, Quantity, Estimated Value, and Authority, for each missing component, and

(H) Whether each item is a component that was short on a prior shipment, and, for components that were short on a prior shipment, the date of the prior shipment.

(3) The Seller shall enclose the Buyer specified number of copies of the Buyer furnished DD Form 250 in the lowest numbered package of the shipment or seal them in a waterproof envelope, which shall be securely attached to the exterior of the lowest numbered package of the shipment in the most protected location. If there is more than

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one package in the shipment, the Seller shall print the words "CONTAINS DD FORM 250" on the package containing the DD Form 250.

(q) TECHNICAL INFORMATION RELEASES AND PUBLICATIONS {Prime contract H.4}

As authorized by paragraph (d)(1) of the Rights in Data -General Clause of this contract, the following exception shall apply:

During the performance of this contract, if data relating to this contract is planned for use in oral or written presentations, professional meetings, seminars, or in articles to be published in professional, scientific, and technical journals and similar media, the Seller shall assure that an advance information copy of the presentation or article is sent to the Space Station Program (SSPO) to have the benefit of advance information concerning accomplishments of interest, and will provide the SSPO an opportunity to make suggestions to the Seller concerning revisions if it is considered that such comments might be useful to the Seller to help assure the technical accuracy of the information to be presented or published. The information copy will be forwarded to the technical monitor of the contract at least four weeks in advance of the date the author intends to give the presentation or submit the article for publication.

The advance information copy may be submitted in the format or medium which will be utilized in its ultimate release.

Nothing in this clause waives any requirement in the General Provisions PUBLICITY article.

(r) PRICING OF COMMON ITEMS TO INTERNATIONAL PARTNERS {Prime contract H.6 and J-11}. This clause does not apply to commercial items, as that term is defined in FAR 2.101, or to items whose price is set by law or regulation.

(1) The Government has entered into agreements with International Partners (IP) which contemplates that certain space station "common items," previously intended to be procured by NASA, will now be acquired directly by the contractors of these organizations from the United States development contractor. These agreements provide, among other things, that NASA will take the necessary contractual steps to enable that common items can be procured by International Partner contractors for Space Station use, and to ensure that the recurring cost to such contractors consistent with the cost basis paid by NASA.

(2) In order to carry out the intent of the above, the Seller agrees as follows:

(a) If the Seller is requested by an IP contractor to submit a proposal for any item being supplied under this contract, the Seller agrees to estimate such items to such contractor consistent with the unit price or recurring costs estimated for such items in this contract; provided, however, that if there are differences in the circumstances under

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which the items are being priced to the contractor (e.g., greater or lesser quantities, configuration changes, alternative business relationships, variances in schedule requirements, break in production, actual price experience, etc.), the Seller's estimate of the items may vary to the extent of such different circumstances.

(b) Each proposal provided to an International Partner contractor shall include a reference to the unit price or recurring costs estimated for such items in this contract as well as an explanation of any differences.

(c) Seller agrees to negotiate in good faith with any International Partner contractors desiring to buy items supplied under this contract, and to do so in a manner consistent with the terms of this clause.

(3) Seller will flow this clause to lower tier subcontracts to the extent practical and possible, except as noted below. This clause has no application to (1) contracts entered into prior to the effective date of this contract, (2) commercial items, as that term is defined in FAR 2.101, (3) items whose price is set by law or regulation, (4) non-deliverable tooling, non-deliverable shop aides, similar non-deliverable equipment, and similar non-deliverable software, or (5) non-deliverable items consumed in the manufacturing process.

(s) **SYSTEM ADMINISTRATOR SECURITY CERTIFICATION PROGRAM** {Prime contract H.41}

In addition to any other requirements of this contract, all individuals, contractors or subcontractors who perform tasks as a system administrator or have authority to perform tasks normally performed by system administrator shall be required to demonstrate knowledge appropriate to those tasks. This demonstration, referred to as the NASA System Administrator Security Certification, is a two-tier assessment to verify that system administrators are able to –

(1) Demonstrate knowledge in system administration for the operating systems for which they have responsibility.

(2) Demonstrate knowledge in the understanding and application of Network and Internet Security.

Certification is granted upon achieving a score above the certification level on both an Operating System test and the Network and Internet Security Test. The Certification earned under this process will be valid for three years. The criteria for this skills assessment has been established by the NASA Chief Information Officer. The objectives and procedures for this certification can be obtained by contacting the IT Security Awareness and Training Center at (216) 433-2063.

A system administrator is one who provides IT services, network services, files storage, web services, etc. to someone else other than themselves and takes or assumes the responsibility for the security and administrative controls of that service or machine. A

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lead system administrator has responsibility for information technology security (ITS) for multiple computers or network devices represented within a system; ensuring all devices assigned to them are kept in a secure configuration (patched/mitigated); and ensuring that all other system administrators under their lead understand and perform ITS duties. An individual that has full access or arbitrate rights on a system or machine that is only servicing themselves does not constitute a "system administrator" since they are only providing or accepting responsibility for their system. An individual that is only servicing themselves is not required to obtain a System Administrator Certification.

(t) GOVERNMENT-PROVIDED RUSSIAN LANGUAGE AND LOGISTICS SERVICES (RLLS) {Prime contract H.46}

The Seller is authorized use of the following RLLS in performance of this contract or any subcontract entered into under this contract:

1. Russian Translations
2. Russian Interpretations
3. Russian Language training
4. Russian Logistics services (both in the U.S. and in Russia), including a) Ground Services (e.g. airport pickup/drop-off, transportation between hotels and meeting locations); b) Meeting Services (e.g. coordination of schedules, agendas, and protocols); c) Hotel Reservations at the Renaissance Hotel - Olympic Penta in Russia; and d) Visa Coordination.

The Contracting Officer shall be promptly notified by the Seller, via the Buyer's Authorized Procurement Representative, upon identification of a need for RLLS. The Contracting Officer shall provide instructions as to the point of contact for submitting a request for RLLS. Failure of the Government to provide adequate or timely RLLS shall entitle the Seller to an equitable adjustment in all affected contract terms and conditions, exclusive of any adjustment to profit or fee. This provision, including this flow-down requirement, shall be inserted in all subcontracts where it is anticipated that RLLS may be necessary for contract performance.

(u) SUBCONTRACTING WITH RUSSIAN ENTITIES FOR GOODS OR SERVICES {Prime contract H.48}

(1) The Seller shall not subcontract with

- (a) the Russian Aviation and Space Agency (Rosaviakosmos),
- (b) any organization or entity under the jurisdiction or control of Rosaviakosmos, or
- (c) any other organization, entity, or element of the Government of the Russian Federation.

(2) "Organization or entity under the jurisdiction or control of Rosaviakosmos" means an organization or entity that

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(a) was made part of the Russian Space Agency upon its establishment on February 25, 1992;

(b) was transferred to the Russian Space Agency by decree of the Russian Government on July 25, 1994, or May 12, 1998;

(c) was or is transferred to the Russian Aviation and Space Agency or Russian Space Agency by decree of the Russian Government at any other time before, on, or after March 14, 2000; or

(d) is a joint stock company in which the Russian Aviation and Space Agency or Russian Space Agency has at any time held controlling interest.

(3) The Seller shall obtain the Contracting Officer's permission, via the Buyer's Authorized Procurement Representative, to subcontract with any Russian entity or with any other entity performing any part of the contract in the Russian Federation. The Seller shall support such a request with facts (and, if requested, supporting documentation) sufficient to establish to the Contracting Officer's satisfaction that the entity with which the Seller seeks permission to subcontract is not an entity described in paragraphs (1) and (2).

(4) The Contracting Officer may direct the Seller to provide the information required under paragraph (3) for any other prospective or existing subcontract at any tier. The Contracting Officer may direct the Seller to terminate for convenience any subcontract at any tier with an entity described in paragraphs (1) and (2), subject to an equitable adjustment.

(5) The Seller shall include the substance of this clause in all its subcontracts, and shall require such inclusion in all other subcontracts of any tier.



UTM Company History

Established by UTM in 1980, Aeroflex UTM was originally a research house charged with developing semiconductor products for use across UTM's product lines, most notably Pratt & Whitney jet engines. In 1986, Aeroflex UTM expanded its charter to include a fully integrated production capability and to supplying semicustom and military standard VLSI circuits to aerospace and defense markets outside of UTM.

In 1995, Aeroflex UTM changed course, selling its wafer fabrication facility to become the first fab-independent supplier of high reliability VLSI circuits to the aerospace and defense marketplace. Aeroflex UTM's traditional customers now benefit from the increased technology and manufacturing flexibility offered by Aeroflex UTM's multiple foundry partners, while continuing to enjoy the customer service, design innovation, and high quality that Aeroflex UTM has long offered. Further, Aeroflex UTM can now develop a broader set of products and address expanded markets.

Aeroflex UTM was formed in January 1997 through the merger of United Technologies Microelectronics Center, Inc. (UTMC) and Hamilton Standard Commercial Aircraft Electronics, Inc. (HSCAE).

In February, 1999, Aeroflex UTM was purchased by Aeroflex Incorporated of Plainview, New York.

Aeroflex, through its subsidiaries, utilizes advanced technologies to provide state-of-the-art electronic packaging and testing solutions used in communication applications. Aeroflex designs and manufactures microelectronic circuits and interconnect products, instrument products and motion control systems, for commercial and defense markets. It also designs and manufactures shock and vibration stabilizing systems used for commercial, industrial and defense applications.

Over the years Aeroflex UTM has developed a broad range of semicustom, MIL-STD-1553 and radiation-hardened products and has leadership positions in its markets. Aeroflex UTM has established a strong reputation for quality and customer service, and has received numerous commendations from its customers. Additionally, Aeroflex UTM engages in government- and customer-funded research and development programs.

Aeroflex UTM Technology Background

Aerospace Products

Standard Products

Aeroflex UTM supplies a broad range of standard products for avionics and space applications including microcontrollers, logic, programmable logic, memory and serial communication interfaces for MIL-STD-1553 and 1773. All products meet specifications over the full -55°C to + 125°C temperature range and are screened according to specific test methods of MIL-PRF-38535. We offer many devices as Standard Microcircuit Drawings.

Aeroflex UTM has the widest selection of MIL-STD-1553 products in the industry. The product family consists of the μ MMITTM Family, BCRT Family, Remote Terminal Family and Transceiver Family of 1553 interface products. The UT69151 μ MMITTM E is a full-featured bus controller, remote terminal, and monitor designed to meet the flexibility requirements of the latest avionic and satellite systems. The UT69151 μ MMITTM LX/DXE provides designers with integrated protocol and transceiver solutions in 1.3in². The UT69151 μ MMITTM XTE provides designers with a complete MIL-STD-1553 interface (i.e. protocol, transceivers and memory) in 1.9in². The latest addition is the UT69151 μ MMITTM RTE, a dual-redundant 1553 remote terminal with integrated bus transceivers, and memory offered in a 1 sq-in 132-qual flatpack.

The 1553 BCRT (Bus Controller/Remote Terminal) is a multi-function 1553 interface which features advanced memory structures and powerful message handling. Variations of the BCRT -- the BCRTM (Monitor) and BCRTMP (Multi-Protocol) -- readily adapt to a variety of 1553 bus applications. The Remote Terminal Family of interface products includes the Remote Terminal Multi-Protocol (RTMP), Remote Terminal with RAM (RTR), 1760A Remote Terminal for Stores (RTS), and RTI Remote Terminal Interface (RTI). The transceiver line includes monolithic 1553A/B transceivers which are fit and functionally compatible to industry-standard 63M1XX and 63M14X series transceivers. The UT63M14X complies with either 1760 or 1553 and is available radiation-hardened.

Targeted for spaceborne applications, Aeroflex UTM's LVDS transmitter and receiver products will address an increasing demand to move data quickly between points within a satellite. Moving large amounts of data requires an extremely high performance solution that consumes low power, generates little noise and is relatively immune to noise. LVDS products from Aeroflex UTM will provide high performance, low power, low noise, and low cost solutions to interface problems commonly found in satellite and satellite launch vehicle applications. We also offer a LVDS Evaluation Card which provides a simple means to evaluate the line driving capability and performance of Aeroflex UTM's LVDS products.

Aeroflex UTM's expanding line of radiation-hardened standard products includes microcontrollers, programmable logic, medium scale integration (MSI) logic, a memory family and standard product cards all targeted for satellite and launch vehicle applications. Aeroflex UTM's processor family includes a 16-bit RISC microcontroller, a MCS-51 compatible 8-bit microcontroller (UT69RH051) and MCS-96 compatible 16-bit microcontroller (UT80CRH196KD) with FirstPass Core IP. RISC software support includes a UNIX based C-Compiler, assembler, linker and interactive PC based simulator. Aeroflex UTM's logic family includes the RadHard MSI family, UT54ACS164245S MultiPurpose Transceiver with cold sparing, and the RadPALTM (UT22VP10). Built using proven radiation-hardening techniques, the RadHard MSI family offers a large selection of simple and complex high speed TTL and CMOS compatible logic devices. The RadHard MSI family is fit, form, and functionally compatible with industry-standard components.

Aeroflex UTM's memory family includes the 8K x 8, a 4K x 8/9 radiation-hardened Dual-Port SRAM, 3V and 5V 8K x 8 PROMs and 32K x 8 PROMs. To address at-speed verification and post program burn-in issues, Aeroflex UTM developed a PROM programming hardware suite. Our three low-cost 4Mbit SRAMs are ideal for space applications. Offered in speed grades of either 100ns or 25ns, the 25ns product boasts a SEU rate of 1E-10 errors per bit day. An addition is a UT8Q1024K8 SRAM containing two 512K x 8 SRAMs. We also have the UTXQ512K32 16Megabit SRAM MCM, a high-performance 2M byte CMOS static RAM multi-chip module (MCM), organized as four individual 524,288 x 8 bit SRAMs with a common output enable. Our latest memory offerings are 4M Async SRAMs organized x8, x16, x32 with 1.8V core and 2.5V to 3.3V I/O.

Aeroflex UTM's Standard Product Family's first board product, the UT131 Embedded Controller Card, is based on a MCS-96 ISA compatible 16-bit RadHard Microcontroller. The low-cost ECC provides the satellite system integrator with a commercial-off-the-shelf (COTS) solution that is radiation hardened for space and offers reliable subsystem interface and control functionality. Customized versions are also available.

Semicustom Products

Aeroflex UPMC now offers several technologies to meet a variety of ASIC needs. All semicustom products meet specifications over the full -55°C to +125°C temperature range and are screened according to specific test methods of MIL-PRF-38535.

The QML Class Q and V RadHard UTR0.8µ Gate Array Family is built using advanced CMOS technology that provides up to 200,000 usable gates with megarad total dose hardness.

The UT0.6µ CRH/SRH Gate Array Family is built in a commercial fab using advanced Commercial RadHard™ or Strategic RadHard™ CMOS technology with usable gates up to 600,000 and 300Krad to 1 Mega rad total dose hardness. Like the UTR0.8µ family, the UT0.6µ gate array family is available in QML Class Q and V product assurance levels. Aeroflex UPMC also offers the UT0.6µ Gate Array Family for non-radiation environments in multiple product assurance levels including QML, military, industrial and customer specific.

Aeroflex UPMC's newest ASIC family, the UT0.25µCRH, is built in a commercial fab using Aeroflex UPMC RadHard techniques with total dose hardness up to 1megarad. For those applications in non-radiation environments, the UT0.25µ ASIC Family is also available without total dose hardness processing. The UT0.25µCRH ASIC Family offers up to 3,000,000 usable gates using structured arrays. The UT0.25µCRH ASIC Family is available in multiple product assurance levels including QML Q and V, military, industrial and customer specific.

All ASIC products feature full compatibility with the JTAG (Joint Test Action Group) standard (IEEE 1149.1) for boundary scan.

Aeroflex UPMC's ASIC design system provides a complete set of tools, libraries and services integrated with tool suites from Mentor Graphics and Synopsys, as well as Verilog and VHDL. The design system is supported on HP, Sun and NT platforms. In addition to the gate array offering, Aeroflex UPMC's cell-based design methodology provides flexibility for applications requiring specialized functions and configurations. The cell-based library includes parameterized cells that can be tailored to fit specific application requirements.

Circuit Card Assembly

The Circuit Card Assembly capability consists of assembly, test and coat in a high mix/low to medium volume operation. Our process equipment and test capabilities provide for state-of-the-art manufacturing and are ISO 9002 approved. We provide full turnkey or consignment sub-contract assembly services for high reliability products. We combine best commercial practices of circuit card assembly with our radiation-hardened integrated circuits to provide CCA solutions for the commercial space industry. Our CCAs are also manufactured for military aircraft engines and environmental control systems along with commercial products, such as Aeroflex UPMC's e.Card Distributed Query Processors.

Commercial Products

Mixed-Signal Products

Aeroflex UPMC's Mixed-Signal capabilities result from our 20 years of experience as a supplier of ASIC solutions. With over 150 man-years of mixed-signal design experience, Aeroflex UPMC can provide mixed-signal technologies such as analog, embedded flash memory, and System on a Chip (SoC) solutions. We also offer ASIC solutions including, analog, digital IC design services. Please see our overview presentation and capabilities brochure to see our heritage. We all have experience in the USB Universal Serial Bus, Sensor Interface, Telecommunication, Medical Image, Bar Code Scanning and Cryptographic IC arena.

ComProducts

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About Aeroflex UTM

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Aeroflex UTM has entered the Content Addressable Memory (CAM) market with the UTCAM-Engine LPM™, tailored for data networking and Internet address processing applications. The engine transforms conventional SRAM or SDRAM into content addressable memory. The e.Card™ distributed query processor is a PCI card designed to accelerate systems requiring extremely fast query resolution. We have recently added a 6u cPCI card and the eCard Lite.

Please feel free to contact our Regional Sales Offices and our Field Application Engineers. They will be happy to answer any questions, either by phone or e-mail.

We want to hear from you. Any comments can be sent on our Literature Order Form or by e-mail to our MARCOM Manager.

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**AEROFLEX UTMC ANNOUNCES
ASIC DESIGN SYSTEM VERSION 3.0 RELEASE**

COLORADO SPRINGS, CO -- Aeroflex UTMC, (NASDAQ:ARXX), announces the next release (version 3.0) of its ASIC Design System for its 0.6 μ m and 0.25 μ m technologies.

"The Aeroflex UTMC ASIC Design System supports design libraries through Synopsys, Cadence and Mentor tools in VHDL or Verilog languages and design signoff in any Vital (VHDL) or OVI (Verilog) compliant simulation environment," said Peter Milliken, director-semicustom products. "In keeping with our customers' evolving needs, this release supports the Linux operating system and an enhanced graphical user interface has been added. Version 3.0 of the Aeroflex UTMC ASIC Design System is now available from our website."

"We are profitable for the fifth year in a row since going fab independent," continued Milliken. "We continue to provide our customers with long-term, assured ASIC supply as a fab independent semicustom ASIC supplier. Our ASICs are installed on numerous customer satellites and ground missions. Customers are very pleased with our technology, our outstanding customer service, and our impeccable on-time delivery of "first-time" prototypes and production flight units."

Aeroflex UTMC's RadHard ASICs are available as Commercial RadHard™ technology with up to 600K useable gates, 5V and 3.3V operations and radiation hardened up to 10E6 rad(Si). Our Strategic RadHard™ technology offers up to 3.0M usable gates, 3.3V, 2.5V and 1.8V operations and are also radiation hardened up to 10E6 rad(Si).

Aeroflex UTMC is a supplier of semicustom and standard VLSI circuits and custom circuit card assemblies. Aeroflex UTMC has received Qualified Manufacturer List (QML) certification for Class Q, Class T and Class V. Additionally, Aeroflex UTMC has received a letter of compliance for ISO 9001 from the Defense Supply Center Columbus.

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For a copy of the ASIC Semicustom Datasheets call 1-800-645-UTMC or visit our home page at www.utmc.com.

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http://wwwold.utmc.com/products/asic_v3_pr.html

10/29/2003

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SYSTEM-ON-A-CHIP

MIXED-SIGNAL ASICs

combine analog and digital signals on the same chip for efficient size and faster performance. Over the past 20 years, as a supplier of these custom and often complex systems, Aeroflex UTMC has built a reputation for excellence. Our good name in the industry is based on our design methodology, technical expertise, rigorous quality system, competitive prices, and on-time delivery.

RCL009345

EXPERIENCE AND RESOURCES COUNT

Aeroflex UTMC has completed over 650 application-specific integrated circuit (ASIC) designs for over 130 customers. We know the only path to good design is by working hand-in-hand with our customers. Our mission is to solve your demanding requirements for integrated circuits that need to work in some of the most challenging applications, including industrial, automotive, communications, medical, commercial, consumer.

Aeroflex UTMC specializes in exploiting technologies that integrate analog, digital, and non-volatile memory functions into a system-on-a-chip. Our experienced designers supply turn-key solutions to meet your most demanding mixed-signal requirements.

Our success depends on your success. Our full-service support over a product's entire life cycle ensures it. From design definition through implementation and design reviews, proof of design silicon, system evaluation and characterization, and long-term production, we have the resources and expertise to support you every step of the way.

UTMC was originally established in 1980 as a design center charged with developing semiconductor products for Pratt & Whitney jet engines. In 1986, we expanded our charter to supply semicustom and military standard circuits to outside aerospace and defense markets using our in-house wafer fabrication facility. In 1995, we became fab-independent, and in 1999 joined Aeroflex Incorporated to become Aeroflex UTMC.

We now have the resources of the entire Aeroflex family behind us. Aeroflex designs, develops and markets an extensive, diverse range of microelectronics and instruments that are in service worldwide. Founded in 1937 and headquartered in Plainview, New York, Aeroflex showed a remarkable 23% growth in the year 2001. Aeroflex directly attributes its success to its 1,400 employees worldwide, who continue to design, develop and and manufacture world class innovative products and technologies.



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FLEXIBILITY IS OUR UNIQUE ADVANTAGE

Because Aeroflex UTMC is a fab-independent semiconductor supplier, we have the flexibility to find and utilize the process technologies that best fit your unique requirements. We have wafer foundry agreements with different suppliers, allowing us to offer the most advanced process technologies while maintaining cost-effective sources of supply. We exploit the advantages of third-party wafer fabrication by maintaining a proprietary scalable design library for mixed-signal and digital ASIC designs that provides vendor and technology independence.

Aeroflex UTMC has the kind of process and device engineering support usually only found on staff at wafer fabrication facilities. Having operated a wafer fab for ten years, we know first hand all aspects of wafer fabrication engineering. When we made the decision to be fab-independent in 1995, we retained our process development and device engineering group along with process and device simulation tools and SPICE model parameter extraction software. This allows us to install our own process modules into commercial foundries and perform exhaustive reviews of each process flow.

Using our automated semiconductor parametric probe systems along with test structures designed in-house, we make independent assessments of the manufacturability of a foundry's design rules. Our own analog test structures extract proprietary SPICE models for analog design, paying close attention to subthreshold regions, device leakage, noise, and breakdown voltages that are not usually accurately modeled for pure digital designs. This means a high rate of first-pass success for our mixed-signal ASIC customers.

Requirements definition

Circuit design

Chip layout

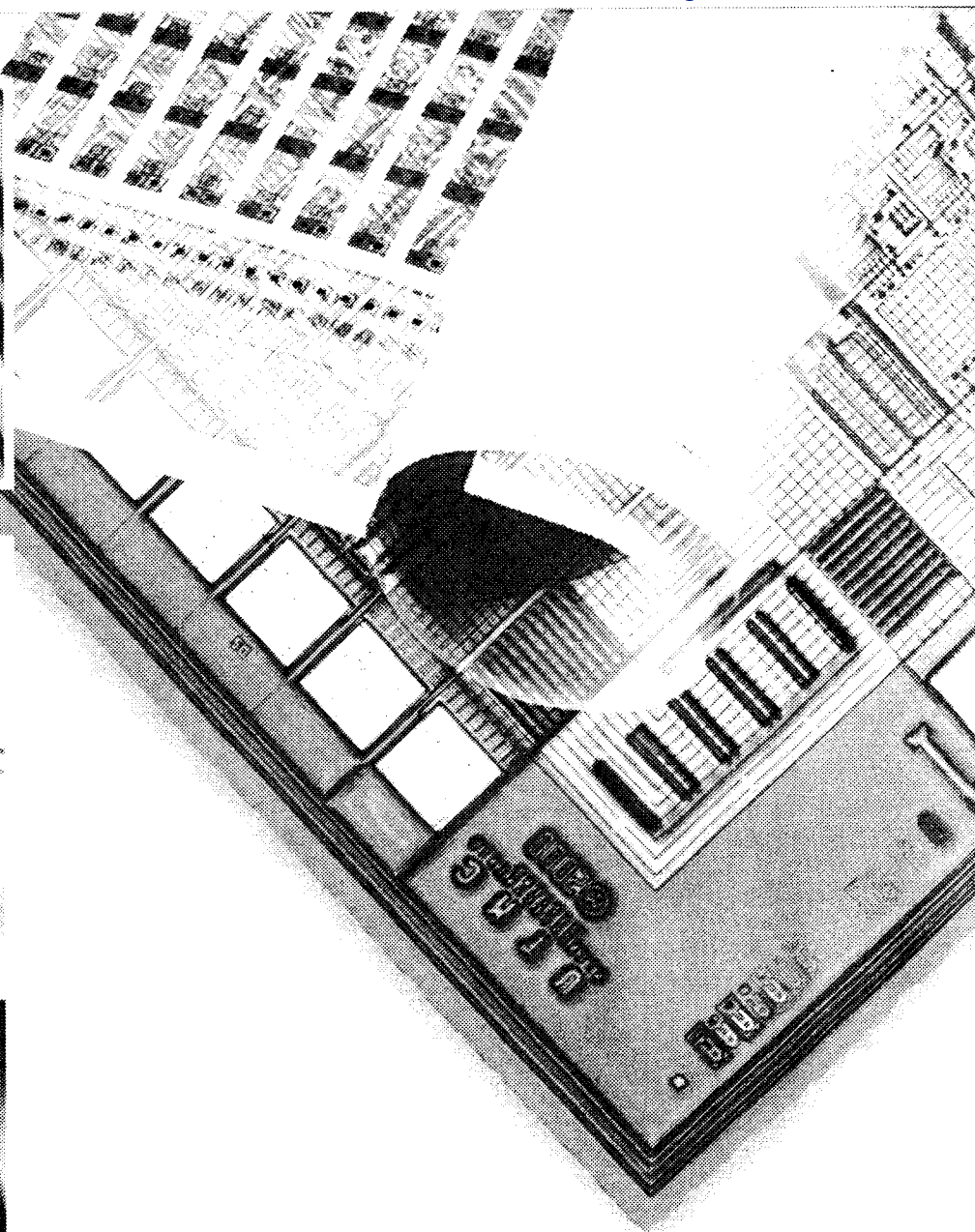
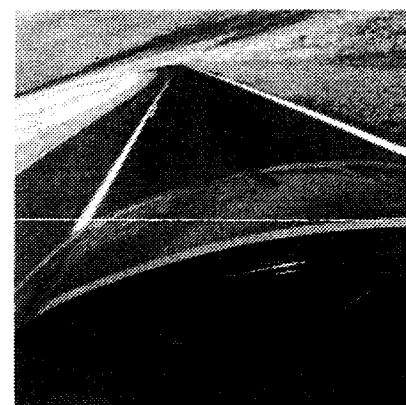
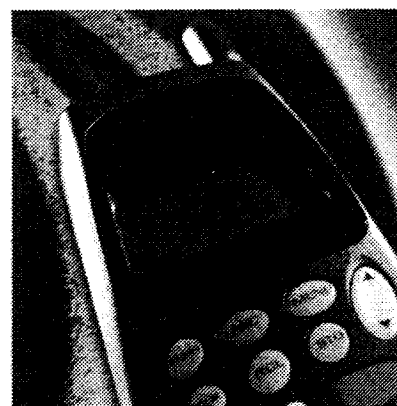
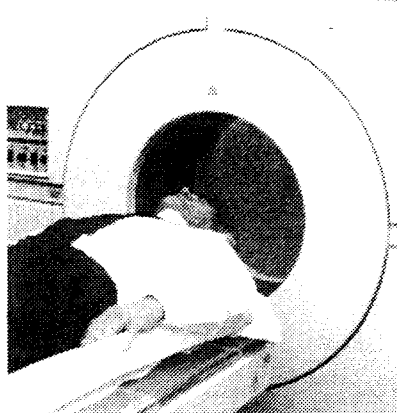
Wafer fabrication

Die packaging and test

Circuit card assembly

Customer support

RCL009347

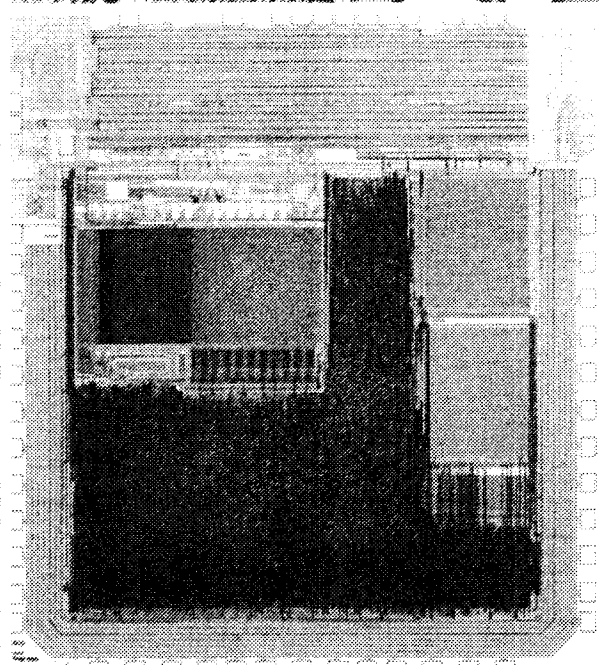


DESIGN EXAMPLES

- Data converters — A/D, D/A, C/F, V/F ■ USB 1.1 and 2.0 interfaces with embedded 8051 microcontroller ■ Spread spectrum receiver /transmitter ICs for wireless applications
- Low-noise, low-level signal processors for medical diagnostic equipment ■ Sensor interfaces: magneto-resistive, Hall effect, X-ray detectors, temperature, accelerometers
- Display drivers — LCD and LED ■ Motor controllers
- Battery charge monitors ■ Elapsed time and event monitors ■ Automotive gauges ■ FPA read-outs — IR, visible, magnetic ■ RF tag ICs ■ Hearing aid ICs ■ Security devices

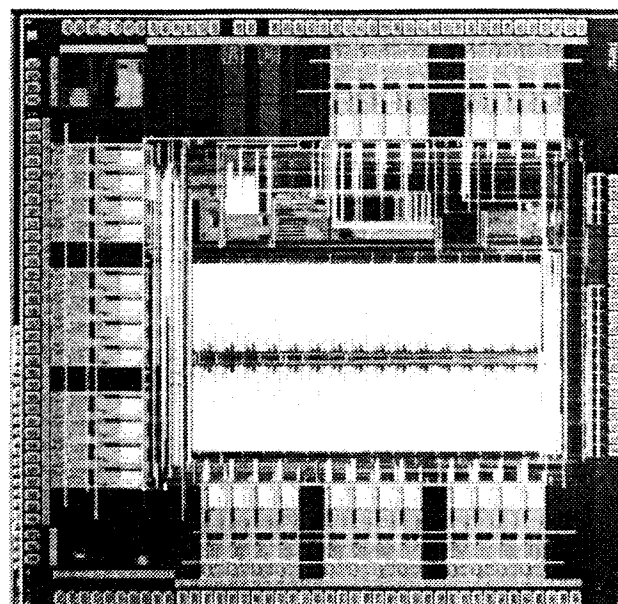
RCL009348

REPRESENTATIVE DESIGN



8051-based SoC

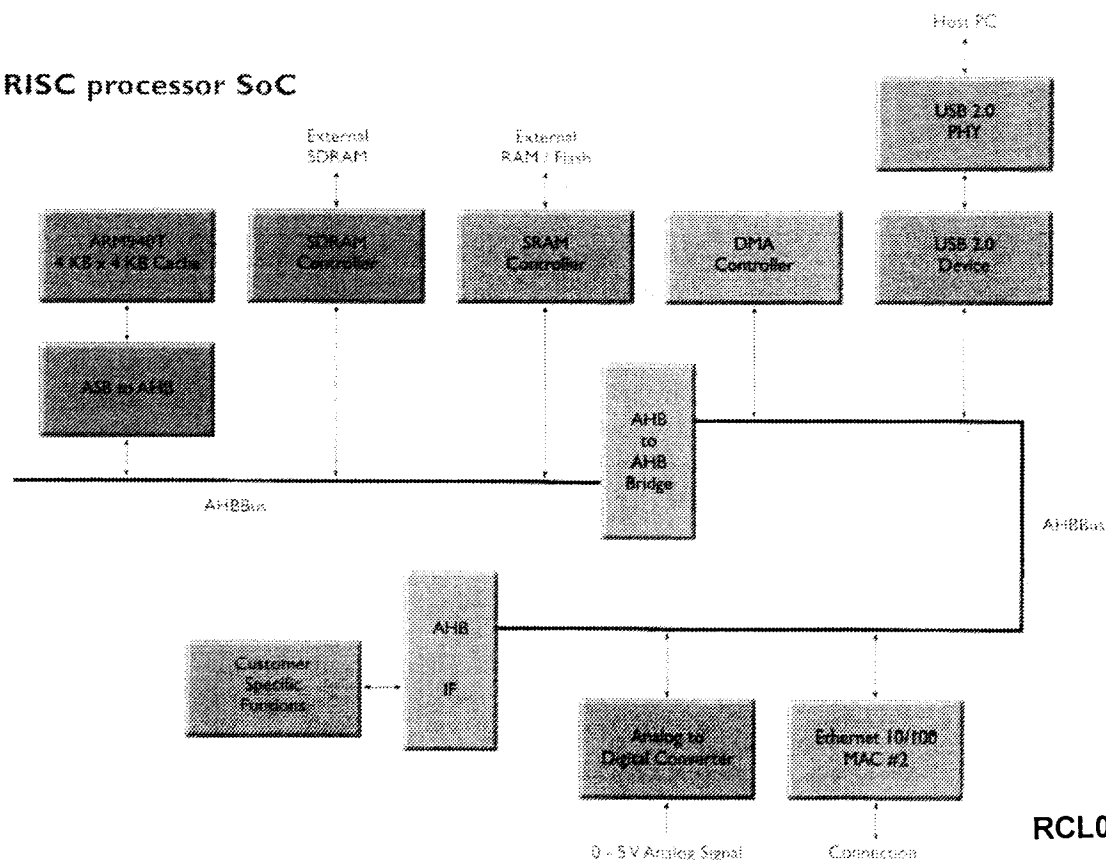
- Custom embedded Flash or advanced Fe-RAM memory blocks with single-voltage programming
- USB 1.1 device and transceiver
- 4X clock multiplier PLL
- 3.3V voltage regulator; trimmable bandgap reference
- RS-232 ($\pm 5V$)



High-precision data acquisition SoC

- 32-channel, 16-bit current A/D
- Low-noise, 45 MHz transimpedance amplifier
- 5pA RMS total integrated noise
- 100M Ω transimpedance @ 10 KHz

ARM RISC processor SoC



RCL009349

Process Feature Size 0.50µm

Basic
Technology

Well structure/substrate options	Twin well/p-Bulk or p-Epi
Isolation	LOCOS
Gate structure	Single gate/SiO ₂
Polysilicon layers	1 - 2
Polysilicon resistors	yes
Capacitors	Poly-poly
Metal layers	2 - 3
Supply voltage (V)	5/3.3
HV transistor options	20V/40V
Non-volatile memory options	EEPROM

ASIC
Digital
Library
Features

Digital core cells (number in library)	332
Digital core cells (density, Kgates/mm ²)	13
Logic delay of NAND2x1, FO=2 (ps)	220
Average power dissipation (µW/gate/MHz)	0.29
I/O cells (number in library)	100
I/O cell voltage	20V/5V/3.3V
Special I/O	USB 1.1, LVDS, RS-232
SRAM	1-port, 2-port, dual port; x8, x16, x32 word sizes
EEPROM	Custom memory sizes; small data storage registers for calibration, etc.
Flash	

Analog
Function
Examples

ADC	8-bit, 20Mps Flash; 8-bit, 20Mps 2-step Flash; 8-bit and 10-bit 200Ksps SAR; 16-bit, 10sps dual-slope
DAC	10-bit, 200Ksps charge redistribution; 8-bit and 10-bit 200Ksps resistor ladder; 8-bit R2R
PLL	200MHz, <100 pS jitter
Band-gap references	pnp (N-well)
Voltage regulators	5V to 3.3V
Charge pumps	+10V, +20V
Oscillators	VCO; crystal
Op amps	Small area/high gain; resistive drive; high-gain/ fast settling; low noise; rail-to-rail; 100MΩ @ 10KHz; 5pA RMS total noise (input referred); <200µV offset

IP Cores

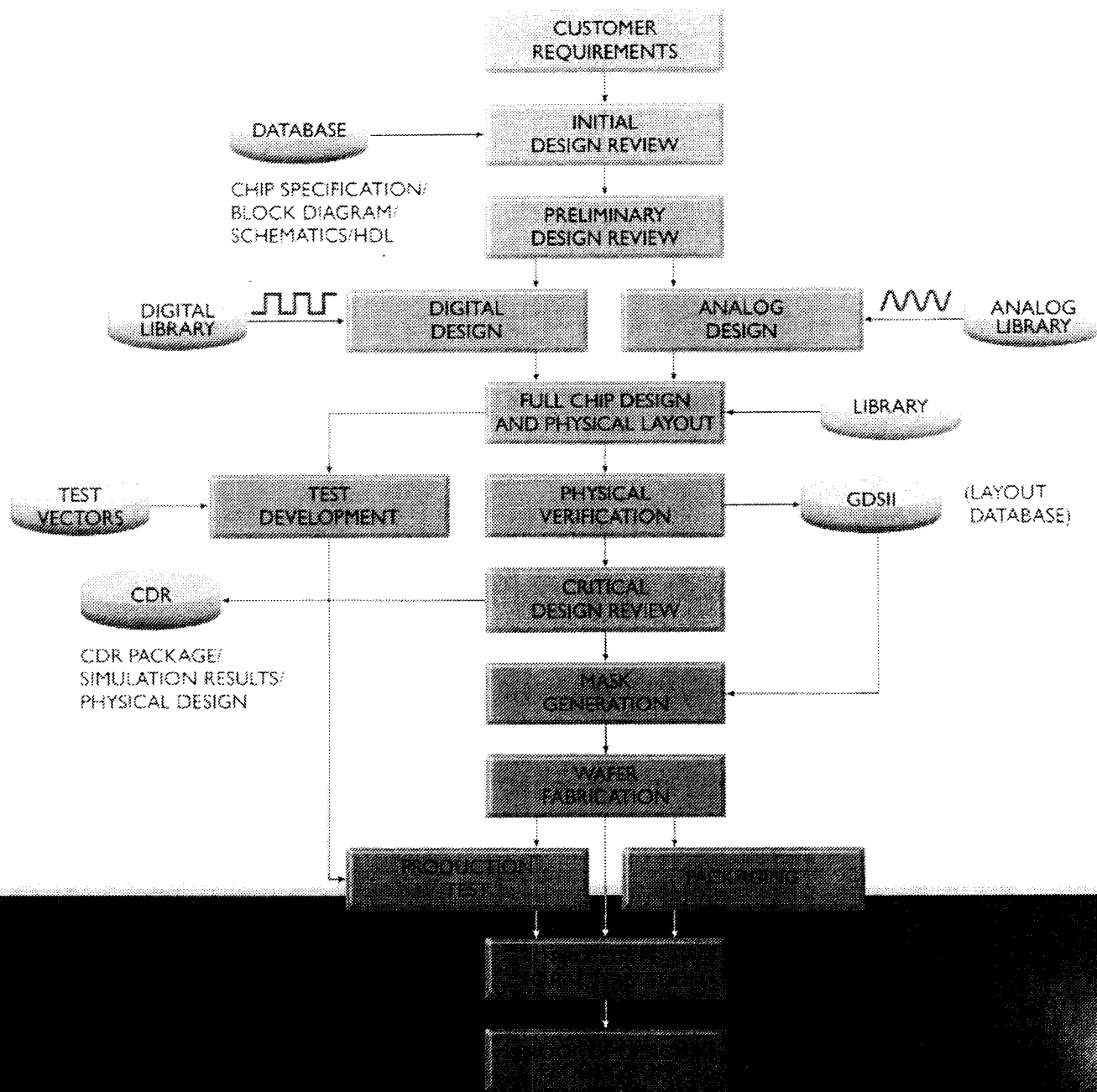
(Available from
Aeroflex UPMC
and/or its IP
provider
partners.
Other IP cores
available upon
request.)

USB 1.1 device or host	synthesizable
USB OTG	synthesizable
USB 2.0 device or host	synthesizable
8051	synthesizable
68HC11	synthesizable
H8	synthesizable
ARM7TDMI	hard macro
ARM720T	hard macro
ARM920T	N/A
ARM922E	N/A
ARM946E	N/A
8051	synthesizable
Oak DSP	N/A

REPRESENTATIVE FUNCTIONS

Process Feature Size 0.35µm	Process Feature Size 0.25µm	Process Feature Size 0.18µm
Twin well/p-Bulk; triple well/p-Bulk	Retro. twin well/p-Bulk; triple well/p-Bulk	Retro. twin well/p-Bulk; triple well/p-Bulk
LOCOS	STI	STI
Dual gate/SiO ₂	Dual gate/NO	Dual Gate/NO
1 - 2	1 - 2	1 - 2
yes	yes	no
Poly-poly	Poly-poly	MIM
3 - 4	4 - 5	4 - 6
5/3.3/2.5	3.3/2.5	3.3/1.8
10V/18V	10V	N/A
Flash	Flash	N/A
348	335	449
18	32	58
143	70	32
0.19	0.15	0.10
88	323	323
5V/3.3V	3.3V	3.3V
USB 1.1; RS232 (+/- 5V); LVDS; PCI	USB 1.1; USB 2.0; LVDS; PCI	USB 1.1; USB 2.0; LVDS; PCI
1-port, 2-port	1-port, 2-port, dual-port	1-port, 2-port, dual-port
x8, x16, x32 word sizes	x8, x16, x32 word sizes	x8, x16, x32 word sizes
Custom, small-sectored Flash for NV data registers	Custom, small-sectored Flash for NV data registers	
Standard or custom sector sizes:	Standard sector sizes	
standard (x8, x16, x32) or custom word size;	8kx8, 16kx8, 32kx8, 64kx8, 64kx16, 16kx32,	
10k and 100k (extended) endurance;	64kx32; 10k cycles endurance;	
up to 4Mb embedded	up to 4Mb embedded	
6-bit, 70Mps Flash; 8-bit, 20Mps, 2-step Flash;	6-bit, 100Mps, Flash; 8-bit, 20Mps, 2-step Flash;	6-bit, 100Mps, Flash; 8-bit, 100Mps, pipeline;
10-bit, 500Ksps, SAR; 10-bit, 2Mps, algorithmic;	10-bit, 500Ksps, SAR; 10-bit, 25Mps, pipeline;	10-bit, 500Ksps, SAR; 10-bit, 30Mps, pipeline
10-bit, 200Ksps, SAR	10-bit, 30Mps, pipeline	
8-bit, 50Ksps, resistor ladder;	8-bit, 50Ksps, resistor ladder;	8-bit, 50Ksps, resistor ladder;
10-bit, 1Mps, resistor ladder;	8-bit, 150Mps, current cell;	10-bit, 1Mps, resistor ladder;
10-bit, 100Mps, current cell;	10-bit, 100Mps, current cell;	10-bit, 100Mps, current cell;
8-bit, 4Mps, resistor ladder;	10-bit, 150Mps, current cell	10-bit, 180Mps, current cell
10-bit, 2Mps, resistor ladder		
Variable 2-50MHz, <250 pS jitter	Variable 10-40MHz	Variable 40-600MHz
npn (triple well)	npn (triple well)	pnp (N-well)
5V to 3.3V	5/3.3V to 2.5V	5/3.3V to 1.8V
+10V, +5V, -5V, -10V	+10V, +5V, -5V, -10V	
1 to 24MHz, 1.5% (meets USB); VCO; crystal	1 to 24MHz, 1.5% (meets USB); VCO; crystal	VCO; crystal
Small area/high gain; resistive drive; high-gain/	Small area/high gain; resistive drive; high-gain/	Small area/high gain; resistive drive; high-gain/
fast settling; low noise; rail-to-rail	fast settling; low noise; rail-to-rail	fast settling; low noise; rail-to-rail
synthesizable	synthesizable	synthesizable
synthesizable	synthesizable	synthesizable
synthesizable	synthesizable	synthesizable
synthesizable	synthesizable	synthesizable
synthesizable	synthesizable	synthesizable
synthesizable	synthesizable	synthesizable
hard macro	hard macro	N/A
hard macro	hard macro	N/A
N/A	N/A	hard macro
N/A	N/A	hard macro
N/A	N/A	hard macro
synthesizable	synthesizable	synthesizable
hard macro	hard macro	N/A

MACROCELL LIBRARY EXPERIENCE



RCL009352

DESIGN ENGAGEMENT

Full turn-key or design-to-specification

Aeroflex UPMC's highly experienced staff of mixed-signal design engineers teams with your product development staff to create complete turn-key ASIC designs to your requirements and specifications. We develop the device specification, design the custom analog and digital circuitry necessary to implement the product functions, and support the product through the entire development and life-cycle production requirements. We truly partner with our customers to create complex mixed-signal VLSI devices that would not otherwise be possible or practical for our customers to create themselves.

Customer net list handoff

Aeroflex UPMC teams with your designers to collaborate on a design that employs your digital ASIC or FPGA design expertise and complements this with our analog design expertise. We translate your digital design to implement the digital requirements, while we concurrently develop the custom analog functions required.

Customer-owned tooling

We complement your VLSI design capabilities to interface at the GDS-II or customer-owned tooling levels. Aeroflex UPMC has partnerships with foundry, assembly, and test service providers, as well as in-house design, product engineering, and test capabilities. Typically, in-house capabilities are employed to rapidly develop a production ASIC and production-ready test program. Then the design is transferred to our low-cost high-volume off-shore production partners.

Packaging options

Aeroflex UPMC has partnerships with the best high-volume packaging suppliers in the industry. We support many popular packaging technologies ranging from high-pincount ball grid arrays to chip scale leaded and leadless packages. We have highly experienced package development engineering resources on staff to support package development and interface to these production partners. We also possess rapid prototyping capability in-house to facilitate development and collaborate with our off-shore production partners, assuring a smooth transition to high-volume production.



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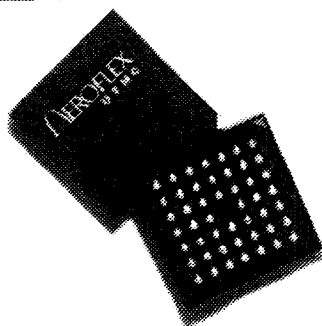
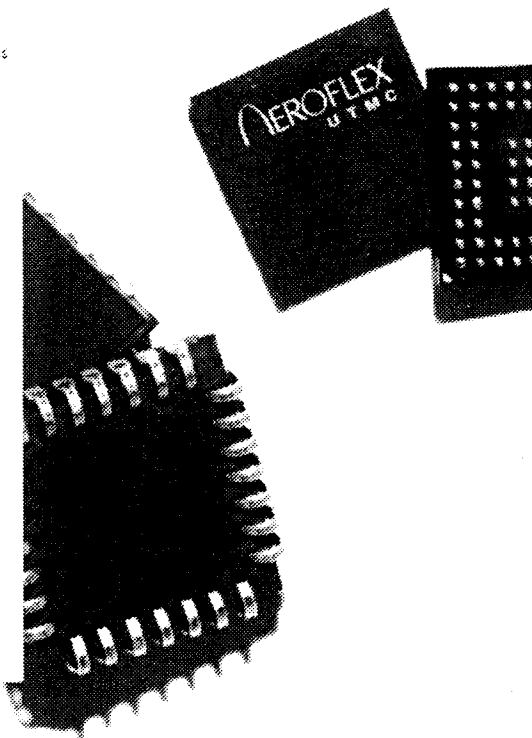
TEST AND PACKAGING CAPABILITIES

In-House Test Equipment

Tester	Type	Speed	Pins	Wafer probe
Teradyne J750	Mixed	100Mhz	256	200 mm
Teradyne Tiger	Mixed	625Mhz	1024	125, 150, 200 mm
Trillium Micromaster	Digital	40Mhz	256	100, 125, 150, 200

Mixed-Signal Packaging Options

Package Type	Lead Counts	Body Sizes
PDIP	8, 20, 24, 28, 40, 42	300 mils (8 only); 600 mils
PQFP	20, 32	5x5
	32, 48	7x7
	44, 52, 64	10x10
	80	12x12
	44, 52, 64, 80, 100, 120, 128	14x14
	64, 80, 100, 120, 128	14x20
	144, 176	20x20
	160, 176	24x24
	120, 128, 144, 160, 184, 208	28x28
PLCC	20, 28, 32, 44, 52, 68, 84	
SOIC	8, 14, 16, 18, 20, 24, 28, 32	300 mils (8, 16 only); 600 mils
TSOP	28, 32	18.4x8 mils
SSOP	16, 28	150 mils
PBGA	84	11x11
	144	13x13
	119, 153	14x22
	196	15x15
	256	17x17
	169, 208, 217, 225	23x23
	225, 256, 272	27x27
	304, 329	31x31
	313, 352, 388	35x35
fpBGA	24	4x4
	36	6x6
	48	7x7 and 7x12
	64	8x8 and 9x9
	80	9x9
	100, 140, 144	10x10
	169	11x11
	160	12x12
	144, 160	13x13
	196, 208	15x15
	256	17x17
	304	19x19



RELIABILITY AND QUALIFICATION TESTING

ENVIRONMENTAL AND QUALIFICATION TESTING

Qualification testing

- HTOL/LTOL (JA108)
- HTB (JA108)
- THB (JA101, JA110, MI004)
- Temperature cycling

Burn-in and life test

- (3) Aehr T2000, with MOS driver boards
- (3) Aehr T2000, with digital/linear driver boards
- Perform static and dynamic burn-ins
- Maximum clock frequency of 2 MHz
- Meets HTOL (JA108)

FAILURE ANALYSIS

Electrical fault isolation

- Liquid crystal
- Photo-emission
- Dynamic voltage contrast

Structural analysis

- Micro-sectioning to 0.2 microns accuracy
- SEM imaging to 100 angstroms
- Selective deprocessing (RIE, wet chemical, plasma techniques)

Package and assembly analysis

- X-radiography
- X-ray fluorescence of plating materials and solder
- SEM and X-ray elemental imaging of defects

Elemental composition

- Energy dispersive X-ray analysis
- Imaging and elemental composition
- Dopant concentration
- Alloy composition

Deprocess/reverse engineering

- Die or component construction
- Metal step coverage
- Competitive analysis

Process and design verification

- Critical design measurement to $\pm 0.2\%$ on <1micron structures
- Fab alignment accuracy

Destructive physical analysis

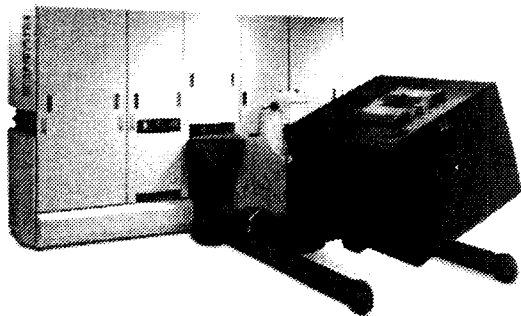
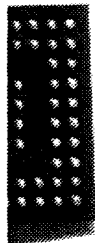
- Meets EIA-469-C and MIL-STD-883 Method 5009
- Qualification testing meets EIA-469-C and MIL-STD-883

Latch-up

- JEDEC-78

ADDITIONAL SERVICES

- Acoustic imaging (plastic or ceramic packages)
- ESD (Electro-static discharge – device tolerance testing)
- Meets MIL-STD-883 Method 3015
- FIB (Focused ion beam)
- Surface analysis (depth profiling, SIMS, Auger, XPS, ESCA)
- Spreading resistance analysis
- Decapsulation (plastic packages)
- Internal water vapor (ceramic packages)
- Residual gas analysis (ceramic packages)



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SYSTEM-ON-A-CHIP MIXED-SIGNAL ASICs

- Twenty years of ASIC design and manufacturing experience
- All levels of design activity supported, full turn-key to customer-owned tooling
- Aligned with the best fab sources in the world
- In-house tester capabilities for rapid and efficient test program development
- In-house rapid prototype assembly and full failure analysis laboratory
- Customer teaming from design conception through production



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800-645-UTMC

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